Technology
Training
Services

Introduction To Microsoft Access 2007

MARICOPA COMMUNITY COLLEGES

Introduction to Access 2007

Written by
Kathleen A. Moser, PhD
Technology Training Services
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Technology Training Services
Maricopa Community Colleges
2411 West 14th Street Tempe, Arizona 85281-6942 (480) 731-8287
http://www.maricopa.edu/training

TECHNOLOGY TRAINING SERVICES VISION & MISSION

Vision

Technology Training Services is dedicated to improving employee job performance at all levels by exceeding expectations in the areas of technology training, instructional design, and customer support.

Mission

Technology Training Services provides leadership and support to the Maricopa Community College District as the District implements new technologies that address challenging administrative needs and educational standards. We design, develop, and deliver the highest quality in-service technology training, materials, and support to all of the employees of the Maricopa Community Colleges.

To fulfill this mission we:

- Provide responsive and accessible technology training on a variety of administrative systems and desktop applications.
- Design and develop comprehensive training and reference materials.
- Provide technology training support in a variety of ways including telephone help lines, one-on-one assistance, online help, troubleshooting, consultation, and referral services.
- Support the colleges' technology training efforts by delivering on-site technology training, delivering Train-the-Trainer sessions, and providing training materials.
- Provide leadership and support to the teams implementing new technologies and administrative systems within the organization.
- Cultivate positive partnerships with our colleges to meet and exceed their training needs and expectations.
- Collaborate with organizational teams to develop strategies to meet future technology training needs.
- Chair and host the Regional Training Committee (RTC) to collaboratively develop training strategies, maintain technology training consistency, and overcome the challenging technology training needs throughout the District.
- Expand and update our knowledge and skills in the areas of technology, training, and instructional design.

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ACCESS 2007 OBJECTIVES

This workshop has been designed to present the following competencies:

1. Review general database concepts and terms.
2. Describe the Access 2007 interface and database objects.
3. Explore an existing database.
4. Design the database.
5. Create a new database:
   - create tables, define fields, set field properties
6. Create a lookup field.
7. Import data from external sources:
   - Excel, Access 2003, Access 2007
8. Create relationships.
9. Create queries:
   - Select queries: duplicate, unmatched, conditional, calculation
   - Action queries: update, make-table, delete
10. Calculate aggregates (sum, count):
    - on tables
    - in queries
11. Create forms and subforms.
12. Manage control layouts and conditional formatting.
13. Create reports.
14. Create a group report.
15. Add controls to reports.
16. Use MS Word mail merge with Access data.
17. Create mailing labels.
18. Integrate programs: export to Word, Excel, and Access 2003.
19. Clone the database.

DATABASE CONCEPTS

Access 2007

Microsoft Access 2007 is a Database Management System that assists in the creation of a relational database to satisfy the diverse data-tracking needs of an organization. Access 2007 provides the user with various features for creating and editing data organized into tables, forms, and reports. It also allows the import and export of data to and from various applications.

Database Definition

A database is a collection of logically related data that can be organized and accessed quickly. The data can be stored as text, numbers, or graphics and can be searched, retrieved, and manipulated. If you have large amounts of data, data that is updated frequently, have many people accessing the data, and want to retrieve data in different formats, a database will work best.

The database not only contains data but also a **definition** of the data which serves as the documentation for your database structure. You won't need to go looking for the database manual to learn how your database was created. That information is contained within the database itself. This is one of the greatest advantages of database management systems.

Relational Databases

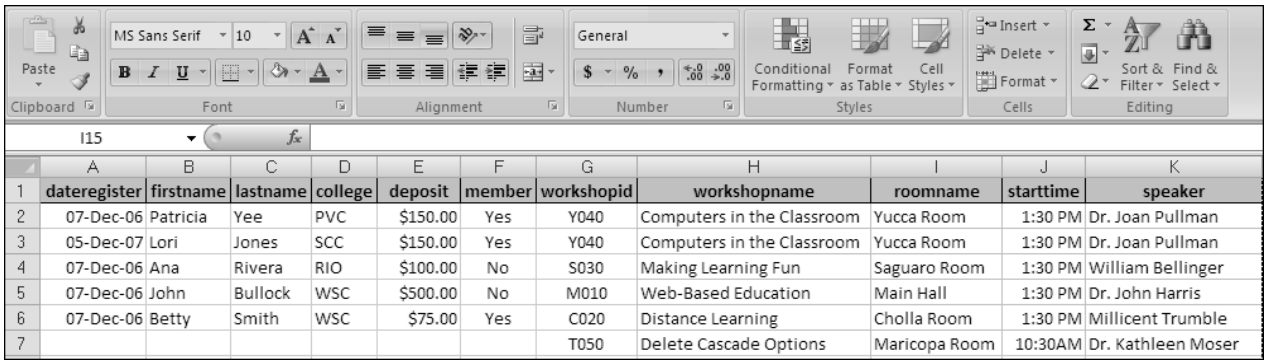
Relational databases store data in a collection of related tables. Each table contains one specific type of information. This table structure ensures that data is stored only once, greatly **reducing** the amount of duplicate data contained within the database. The limited data duplication that occurs is through the **primary** and **foreign** key fields needed to relate the tables. This relational structure helps to preserve the integrity of the data when changes to the data occur.

Basic Elements of a Database

Element	Description
Table	A group of records for one specific type of information.
Record	A group of fields.
Field	A single component that describes the record.
Value	An allowable entry for a field.

DATABASE CONCEPTS

Excel Table:



	A	B	C	D	E	F	G	H	I	J	K
1	dateregister	firstname	lastname	college	deposit	member	workshopid	workshopname	roomname	starttime	speaker
2	07-Dec-06	Patricia	Yee	PVC	$150.00	Yes	Y040	Computers in the Classroom	Yucca Room	1:30 PM	Dr. Joan Pullman
3	05-Dec-07	Lori	Jones	SCC	$150.00	Yes	Y040	Computers in the Classroom	Yucca Room	1:30 PM	Dr. Joan Pullman
4	07-Dec-06	Ana	Rivera	RIO	$100.00	No	S030	Making Learning Fun	Saguaro Room	1:30 PM	William Bellinger
5	07-Dec-06	John	Bullock	WSC	$500.00	No	M010	Web-Based Education	Main Hall	1:30 PM	Dr. John Harris
6	07-Dec-06	Betty	Smith	WSC	$75.00	Yes	C020	Distance Learning	Cholla Room	1:30 PM	Millicent Trumble
7							T050	Delete Cascade Options	Maricopa Room	10:30AM	Dr. Kathleen Moser

Table: Workshops

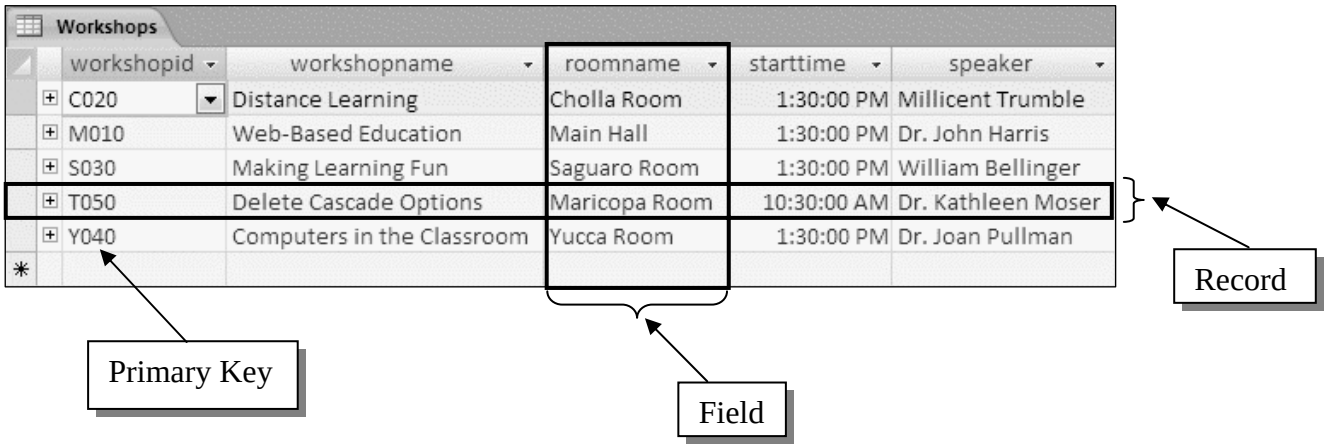
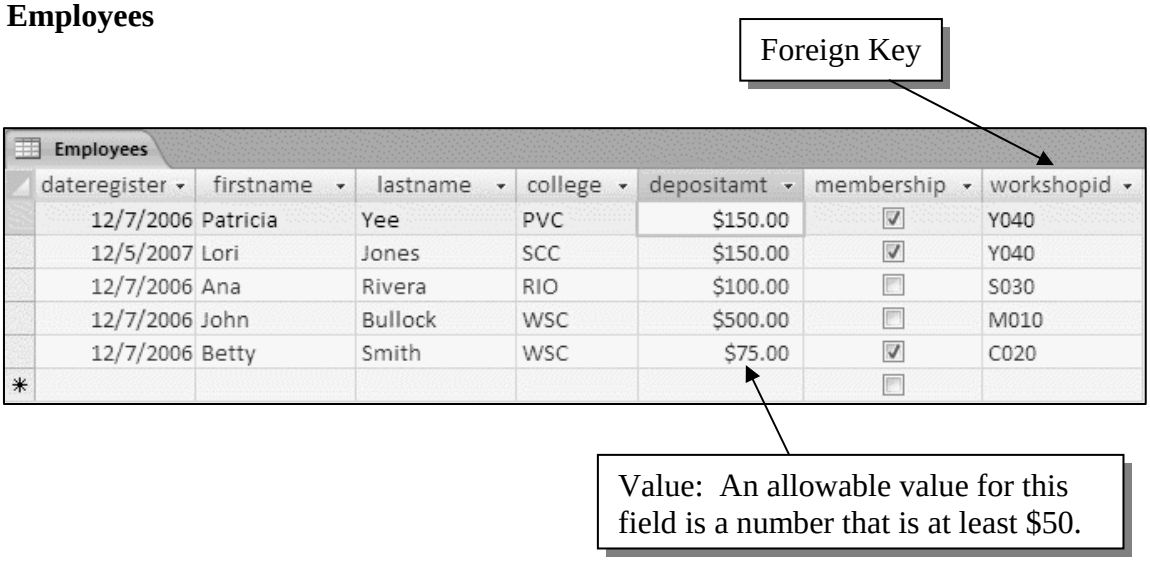


Table: Employees

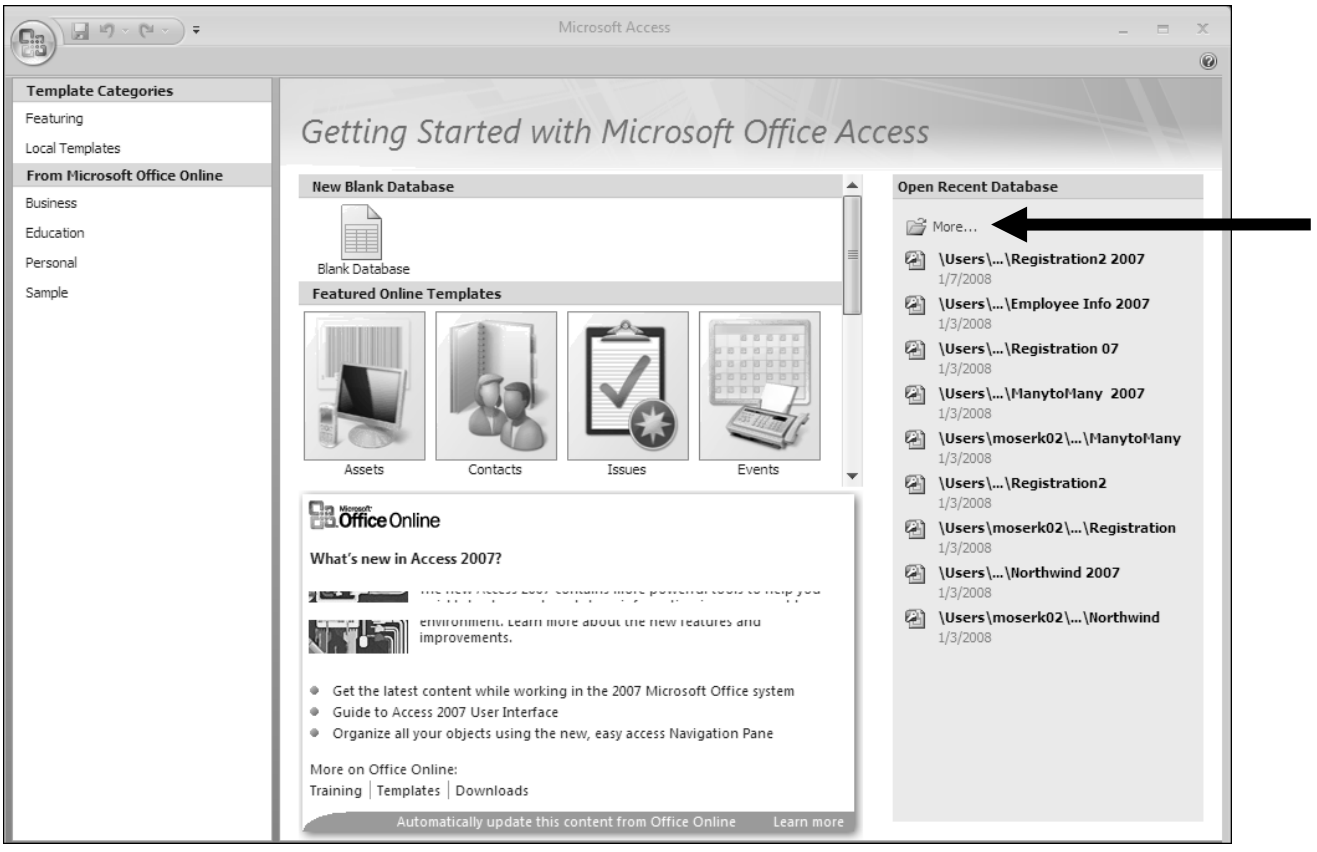


START ACCESS

Getting Started

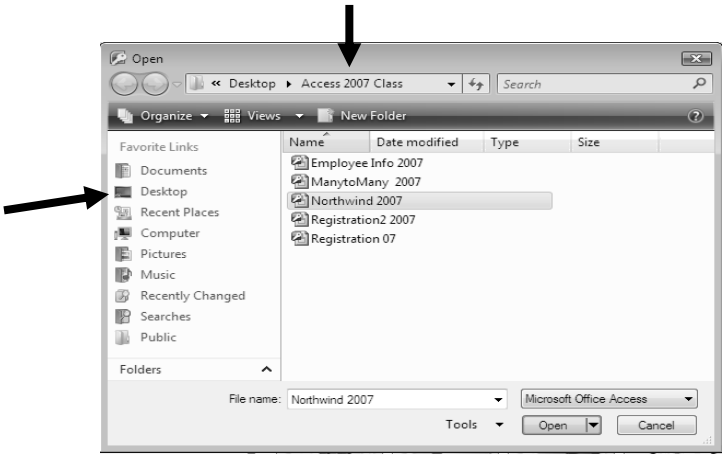
At the Windows Desktop, click the start button on the Taskbar. Choose *Microsoft Office Access 2007* from the start menu.

The *Getting Started With Microsoft Office Access* window opens. The Getting Started screen is divided into three sections. The Template Categories section at the left is used to preview and download predefined templates. In the center, the New Blank Database section is used to start a new database. The section at the right, Open Recent Database, is used to open an existing database file. **Click the *More…*** hyperlink in the *Open Recent Database* section.

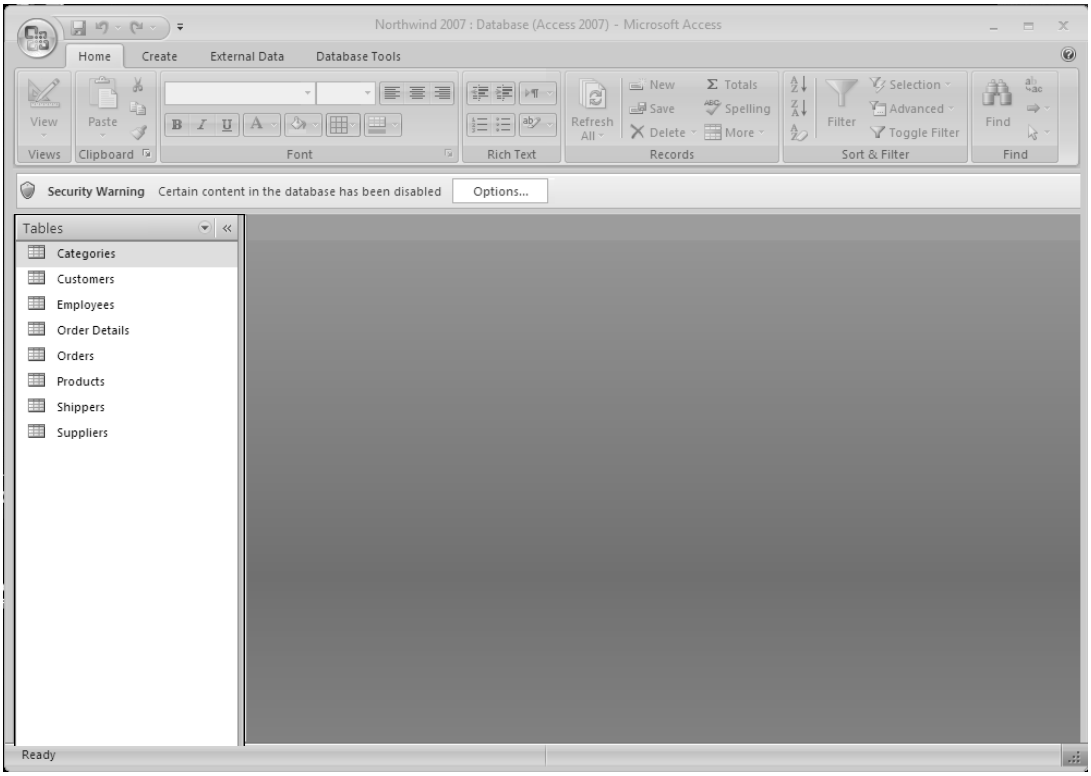


EXERCISE - STARTING ACCESS

1. Open the *Northwind* database. It is located in the *Access 07 Class* folder on the desktop.



2. The Access User Interface opens.



THE ACCESS USER INTERFACE

The Access Interface consists of various tools:

Office Button Located in the top left corner of the office window frame, this button displays a set of commands for creating a new database, opening, saving, printing, managing, emailing, publishing, and closing a database. Access Options assists you in customizing the Access environment. A list of the most recently viewed documents allows quick access to databases you are currently working on.

Quick Access Toolbar The Quick Access Toolbar can be customized to hold your most frequently used commands. It remains visible at all times, reducing the need to search for the proper command tab. By default, it resides above the ribbon, but can be moved below the ribbon.

Ribbon Contains task-specific commands grouped together under command tabs. This new feature of Access 07 is the replacement for the former menus and toolbars.

Navigation Pane Displays database objects such as tables, forms, queries, and reports. Can be customized to display objects by various groupings.

MS Office Window Frame Located at the bottom of the user interface, the frame can be customized to show additional features such as database views, Caps Lock, Scroll Lock, or Num Lock. The Window Frame was previously known as the status bar.

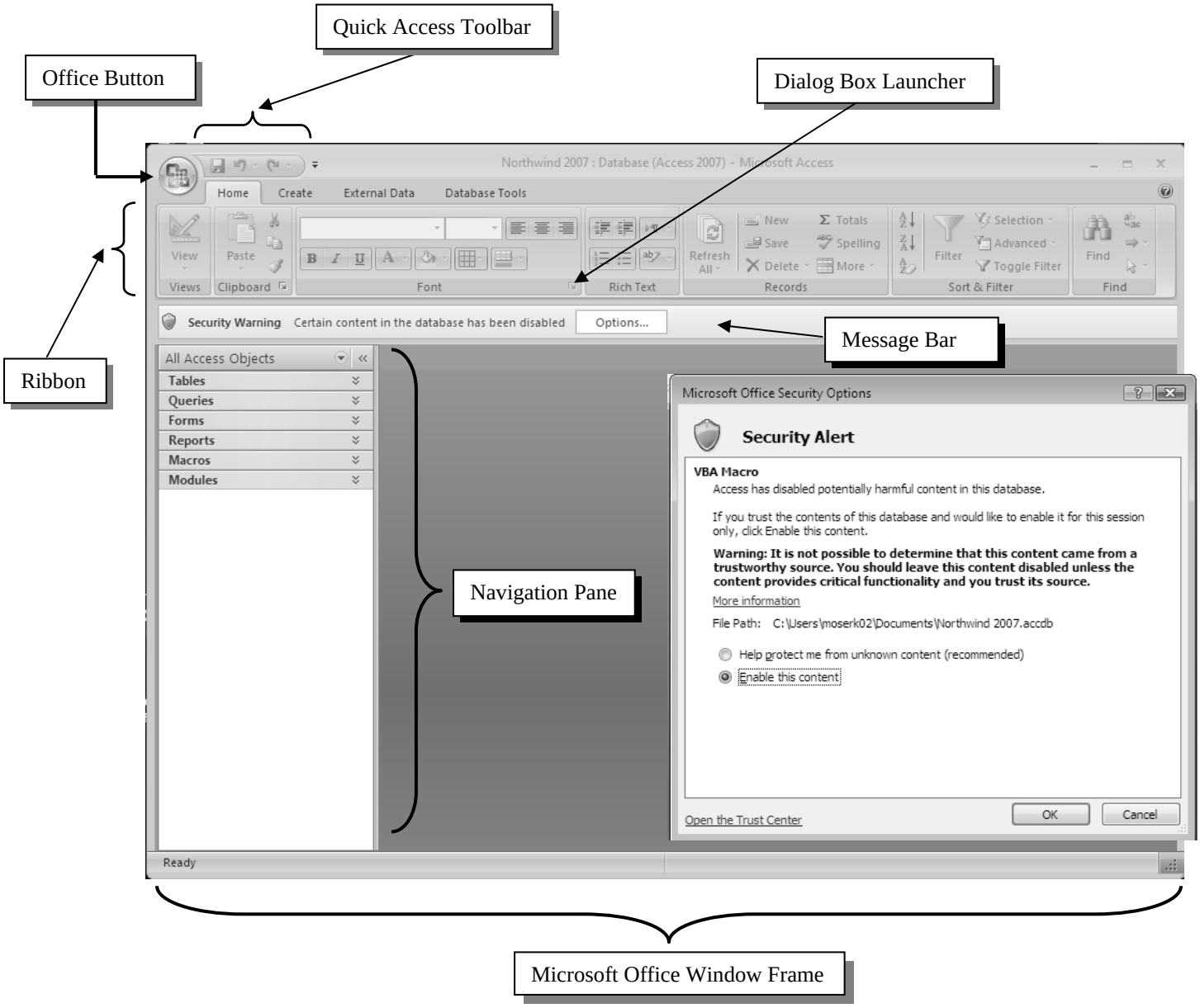
Dialog Box Launcher Miniature buttons found on command tabs provides additional commands and tools associated with the group.

Message Bar Security features cause the message bar to appear below the ribbon when you open a database outside of a trusted location. Enable the full content if you are sure the database is virus-free.

Command Tabs on the Ribbon

Command Tabs	Includes Commands for:
Home	Organize and manipulate data. Includes views, clipboard, font, rich text, sort & filter, and find.
Create	Creating database objects of tables, forms, reports, queries, and macros.
External Data	Importing and exporting data operations.
Database Tools	Defining relationships, showing/hiding tools, analyzing data, moving data to a server, and accessing database tools.

THE ACCESS USER INTERFACE


Quick Access Toolbar
Office Button
Dialog Box Launcher
Ribbon
Message Bar
Navigation Pane
Microsoft Office Window Frame
Northwind 2007 : Database (Access 2007) - Microsoft Access
Home
Create
External Data
Database Tools
Security Warning
Certain content in the database has been disabled
Options...
All Access Objects
Tables
Queries
Forms
Reports
Macros
Modules
Microsoft Office Security Options
Security Alert
VBA Macro
Access has disabled potentially harmful content in this database.
If you trust the contents of this database and would like to enable it for this session only, click Enable this content.
Warning: It is not possible to determine that this content came from a trustworthy source. You should leave this content disabled unless the content provides critical functionality and you trust its source.
More information
File Path: C:\Users\moserk02\Documents\Northwind 2007.accdb
Help protect me from unknown content (recommended)
Enable this content
Open the Trust Center
OK
Cancel
Ready

Unlike other Microsoft applications, only one database can be open at a time in Access.

DATABASE OBJECTS

Navigation Pane Categories

The database contains a variety of objects used to enter, retrieve, manage, and view data. The Navigation Pane, on the left side of the Access User Interface, organizes the database objects into categories and is used to open an object.

Tables are the basic building block of the database. They contain information for related items and are broken down into individual units of information. Data is stored in rows and columns.

Queries are instructions that extract specific information from one or more tables. When you create and save a query, Access stores the set of instructions needed to create the result of the query, not the result itself. This ensures that you receive the most current data each time you run the query. Queries can also be used to perform calculations. Query Wizards are available to ease query development for the novice database user.

Forms are a group of objects which are used to the assist the user in data entry. These objects, or controls, are formatted to create a graphical user interface to enter, display, and edit data. Forms can be customized to include calculations, graphics, and other objects.

Reports are screen outputs of data arranged in various formats as required by the user. Reports can also be customized to include calculations, graphics, and other objects and are most often created for the purpose of printed output.

Pages, Macros, and Modules are beyond the scope of this introductory class and will not be discussed.

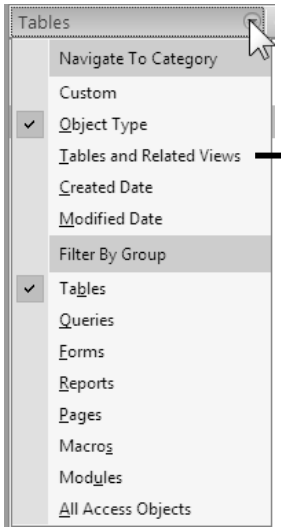
Tabbed Documents

A new feature to Access 2007 is *Tabbed Document Window Viewing*. This feature allows all open database objects to be displayed in the same window allowing easy navigation between the objects.

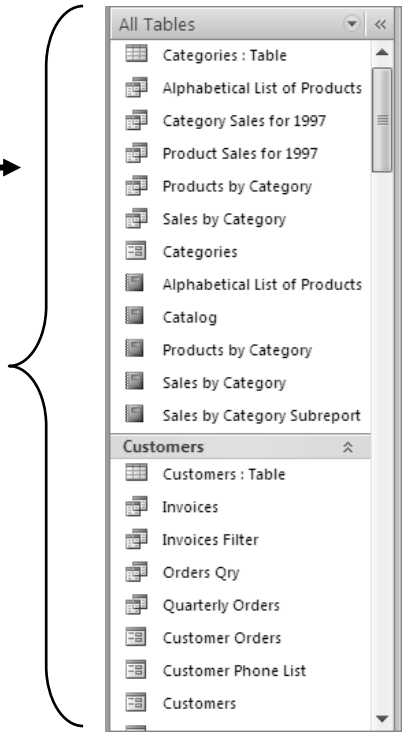
When converting a 1997-2003 Access database to a 2007 Access database, your tab viewing feature may not automatically activate. You can activate this feature through the Access Options button on the Office Button pull-down menu. See the notes on Importing.

DATABASE OBJECTS

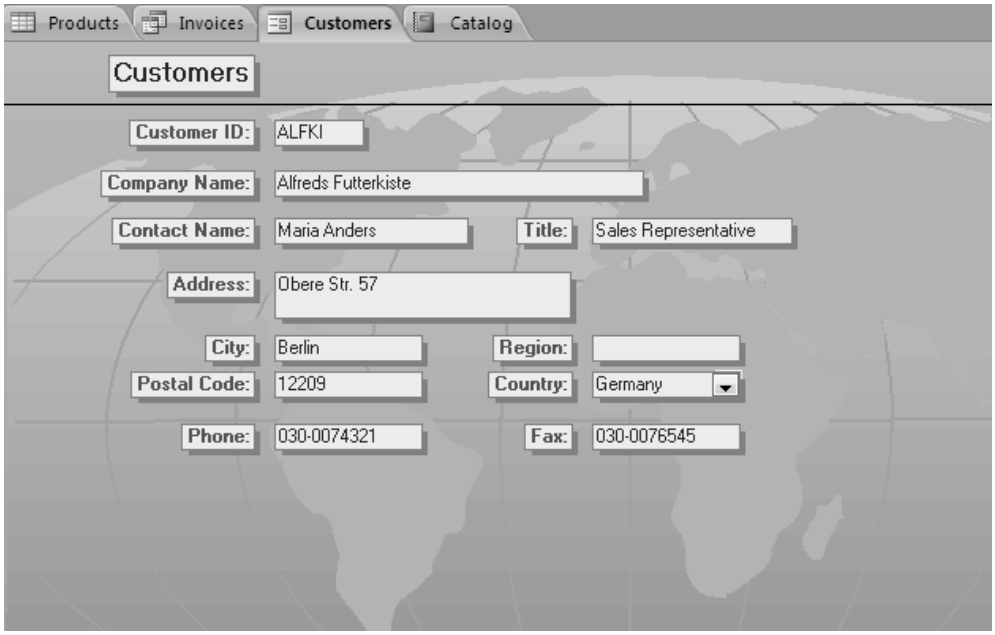
Navigation Pane Categories:



Tables and Related Views



Tabbed Document Window Viewing



EXPLORING AN EXISTING DATABASE

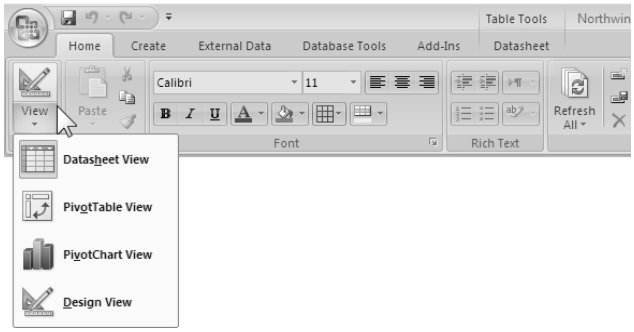
Table Views

Tables are the building blocks of the database and contain information describing the table. Data is organized into rows and columns.

There are two primary views for using tables in Access: **Design View** and **Datasheet View**. **Datasheet View** displays the data in a manner similar to a spreadsheet with a grid of columns and rows and can be used to enter data. In **Design View** the structure of the table is defined including names, descriptions and data types of all fields describing the table. The design view serves as the documentation for your database structure.

Changing Views

The View button on the Home tab allows you to switch back and forth between these two views. You can click on the View button down arrow for a drop-down menu of the two view choices or you can click on the button and it will toggle you back and forth between the two views.

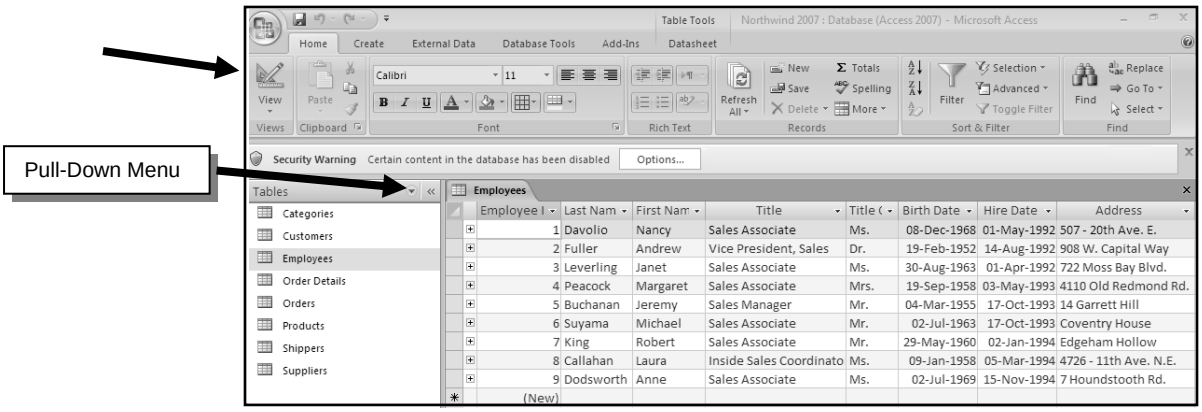


Steps to Switch Views

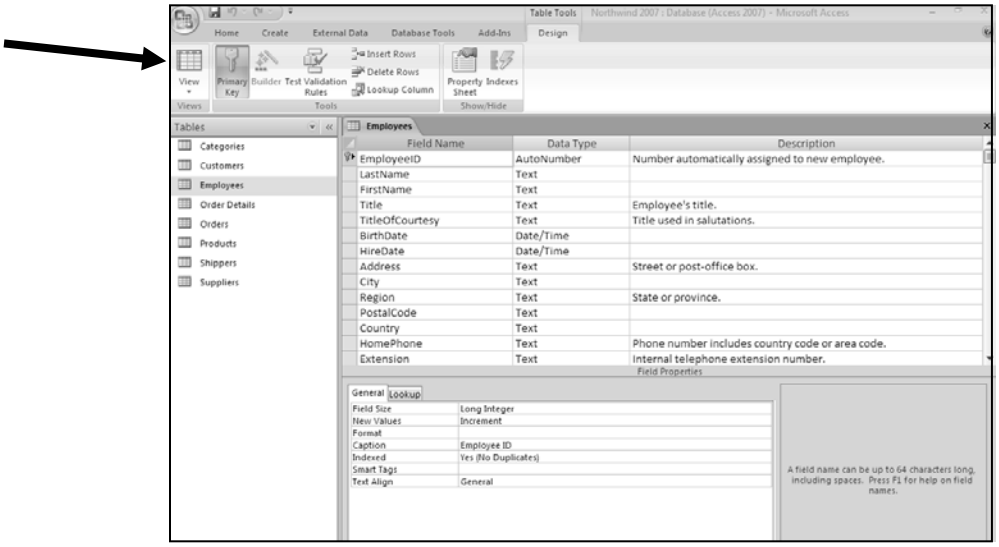
1. On the Navigation Bar, open an existing table.
2. Click to change to Design view.
3. Click to change to Datasheet view.

EXERCISE – CHANGING TABLE VIEWS

1. Use the pull-down menu in the Navigation pane to select *Tables*. Double-click the *Employees* table to open it. The table opens in *Datasheet* view.


Pull-Down Menu
Tables
Categories
Customers
Employees
Order Details
Orders
Products
Shippers
Suppliers
Employees
Employee I
Last Nam
First Nam
Title
Title (
Birth Date
Hire Date
Address
1 Davolio Nancy Sales Associate Ms. 08-Dec-1968 01-May-1992 507 - 20th Ave. E.
2 Fuller Andrew Vice President, Sales Dr. 19-Feb-1952 14-Aug-1992 908 W. Capital Way
3 Leverling Janet Sales Associate Ms. 30-Aug-1963 01-Apr-1992 722 Moss Bay Blvd.
4 Peacock Margaret Sales Associate Mrs. 19-Sep-1958 03-May-1993 4110 Old Redmond Rd.
5 Buchanan Jeremy Sales Manager Mr. 04-Mar-1955 17-Oct-1993 14 Garrett Hill
6 Suyama Michael Sales Associate Mr. 02-Jul-1963 17-Oct-1993 Coventry House
7 King Robert Sales Associate Mr. 29-May-1960 02-Jan-1994 Edgeham Hollow
8 Callahan Laura Inside Sales Coordinato Ms. 09-Jan-1958 05-Mar-1994 4726 - 11th Ave. N.E.
9 Dodsworth Anne Sales Associate Ms. 02-Jul-1969 15-Nov-1994 7 Houndstooth Rd.
(New)

2. Click the View button on the ribbon to switch to *Design* view.



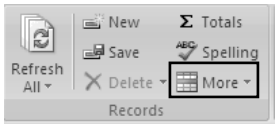
3. Click the View button on the ribbon to switch back to *Datasheet* view.

TABLES – GETTING FAMILIAR WITH DATASHEET VIEW

Moving Around in Datasheet View

The table operations in Access perform much the same way as the spreadsheets do in Excel. Use your right arrow key or press Tab or Enter to move between fields in the table. To move back a field at a time, press the left arrow key or press the Shift key and then press the Tab key.

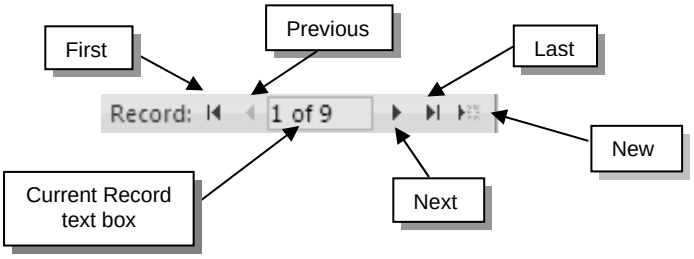
Use the up and down arrow keys between records (rows). The active record is outlined on the datasheet and displayed in the Current Record text box of the *Record Navigation Bar*. An asterisk (*) appears at the row where the next record will be entered.



Some columns may contain data that is not entirely visible. You can adjust the column width in one of two ways: on the *Home* tab in the *Records* group, click the *More* Button or you can position the mouse pointer on the right column boundary line in the header row between columns. Double-click the left mouse button when the pointer changes to a crosshair.

Record Navigation Buttons

At the bottom of the Datasheet window is the Record Navigation Bar for the records in the table.



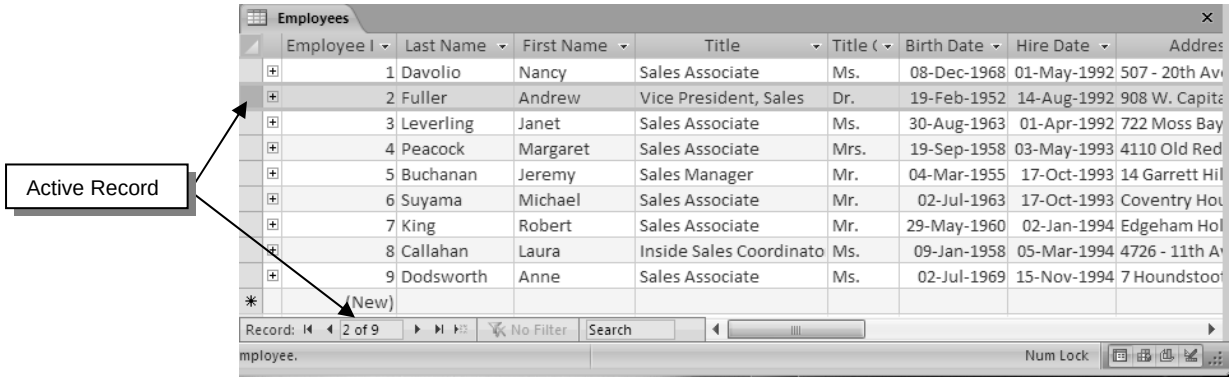
The Navigation buttons move you to the first, last, next, previous, new, or any specific numbered record in the table.

Change Column Width

1. On the *Home* tab in the *Records* group, click the *More* Button.
2. At the drop-down list, click *column width*.
3. At the Column Width dialog box, change the width and click OK.

EXERCISE – MOVING AROUND IN DATASHEET VIEW

1. The *Employees* table is open.


Active Record
Employees
Employee I
Last Name
First Name
Title
Title (
Birth Date
Hire Date
Addres
1 Davolio Nancy Sales Associate Ms. 08-Dec-1968 01-May-1992 507 - 20th Av
2 Fuller Andrew Vice President, Sales Dr. 19-Feb-1952 14-Aug-1992 908 W. Capita
3 Leverling Janet Sales Associate Ms. 30-Aug-1963 01-Apr-1992 722 Moss Bay
4 Peacock Margaret Sales Associate Mrs. 19-Sep-1958 03-May-1993 4110 Old Red
5 Buchanan Jeremy Sales Manager Mr. 04-Mar-1955 17-Oct-1993 14 Garrett Hil
6 Suyama Michael Sales Associate Mr. 02-Jul-1963 17-Oct-1993 Coventry Hou
7 King Robert Sales Associate Mr. 29-May-1960 02-Jan-1994 Edgeham Hol
8 Callahan Laura Inside Sales Coordinato Ms. 09-Jan-1958 05-Mar-1994 4726 - 11th A
9 Dodsworth Anne Sales Associate Ms. 02-Jul-1969 15-Nov-1994 7 Houndstoo
(New)
Record: 2 of 9
No Filter
Search
mployee.
Num Lock

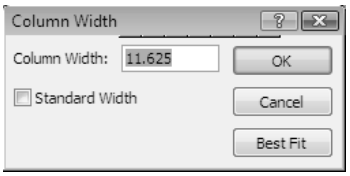
2. Press the Tab key several times to move forward several fields. Go back using Shift/Tab.

3. Press the arrow keys to move up, down, and side-to-side through the data.

4. Click on the *Last Record* Navigation Button to move to the last record.

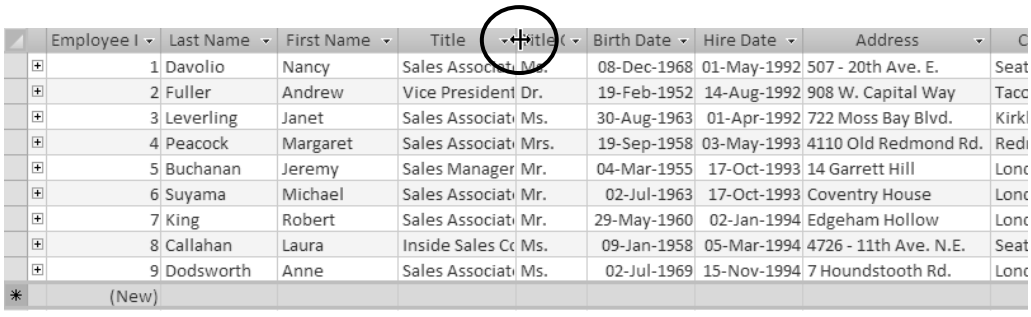
5. Click on the *First Record* Navigation Button to move to the first record.

6. To change column width using the ribbon tools, position the cursor at the field to change. On the *Home* tab in the *Records* group click the *More* Button.



7. At the Column Width dialog box, type a value to increase or decrease the column width or use the Best Fit button to set the width to accommodate the length of the longest entry. Press OK.

8. To use the mouse to best fit a column, position the mouse pointer on the right column boundary line in the header row between columns 4 and 5 until the pointer changes to a crosshair. Double-click the left mouse button.


Employee I
Last Name
First Name
Title
Birth Date
Hire Date
Address
1 Davolio Nancy Sales Associate Ms. 08-Dec-1968 01-May-1992 507 - 20th Ave. E.
2 Fuller Andrew Vice President Dr. 19-Feb-1952 14-Aug-1992 908 W. Capital Way
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9 Dodsworth Anne Sales Associate Ms. 02-Jul-1969 15-Nov-1994 7 Houndstooth Rd.
(New)

DISPLAYING RECORDS IN A SUBDATASHEET

Related Tables

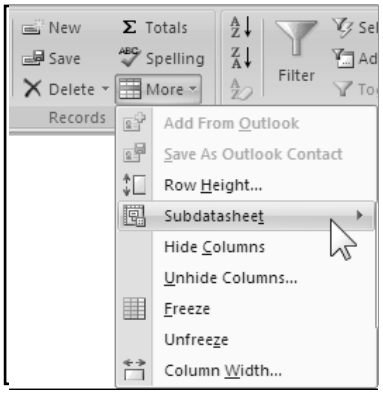
When two tables are linked, you can view related data from the primary table within a datasheet by displaying a **Subdatasheet**. A subdatasheet is a datasheet that is nested within another datasheet showing related data items. When a record has a subdatasheet, it is indicated by a plus (+) sign in the left column called the **expand indicator**. When you click the expand indicator, the subdatasheet is displayed below the selected record.

Editing Data

One of the advantages to displaying subdatasheets is the ability to edit in a table while viewing related information from another table. Because duplicate data is reduced, switching back and forth between table tabs would otherwise be necessary to ensure you are editing the correct record.

Multiple Subdatasheets

If a table has more than one relationship defined, you can choose the subdatasheet you want to see using the More button in the Records group on the Home tab of the ribbon.



Layout Changes

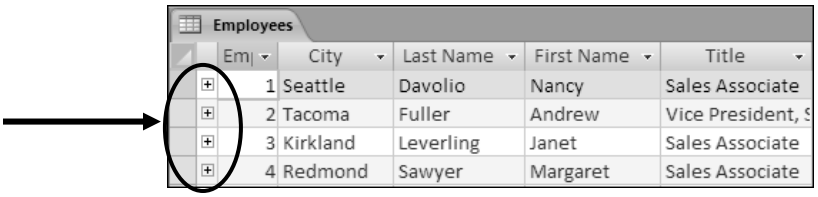
If you switch to another subdatasheet and close the primary table, you will be prompted to save the layout changes. This means that the next time you open the table and use the expand indicator to display a subdatasheet, the new subdatasheet will display.

Expand or Collapse

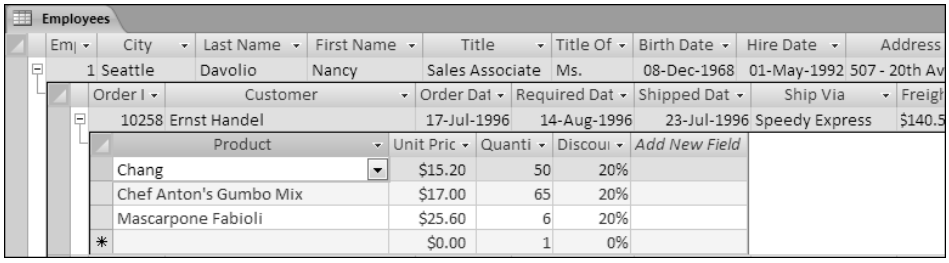
Using the *Expand All* submenu will open all subdatasheets of related data to the primary table. The *Collapse All* submenu will close all subdatasheets.

EXERCISE – DISPLAYING SUBDATASHEETS

1. Click the *expand indicator* next to record to display the related record in a subdatasheet..



2. The subdatasheet opens to display the record for the same employee in the related table *Orders*. Clicking the expand indicator in the *Orders* table opens to display the records for the same order in the related table *Order Details*.

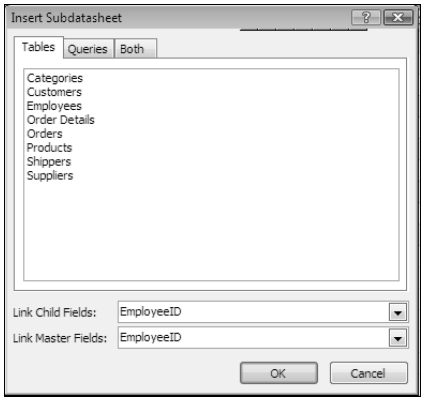


3. The record indicator has now turned to a minus (-) sign. This is the ***collapse indicator***. Clicking the *collapse indicator* will hide the subdatasheet.

4. On the *Home* tab in the *Records* group, click the *More* button. Point to *Subdatasheet* at the drop-down list and click *Expand All*.

5. On the *Home* tab in the *Records* group, click the *More* button. Point to *Subdatasheet* at the drop-down list and click *Collapse All*.

6. To change the subdatasheet display, on the *Home* tab in the *Records* group, click the *More* button. Point to *Subdatasheet* at the drop-down list and click *Subdatasheet*. A list of all related tables for Employees is displayed.



7. Click Customers on the Tables tab. Click OK.

8. Click the expand indicator on any record in the Employees table. Notice the subdatasheet display. Close Employees. Click No to save layout changes.

FINDING AND EDITING RECORDS

Find Command

The *Find* command can be used to quickly move the insertion point to a specific record in a table. This is a time-saving feature when your data tables are very large.

Find Button

The first step in locating a record is to position the insertion point in the column of the data field you want to find. Once the cursor is placed in that field, click on the ***Find*** button located in the Find group on the Home tab of the ribbon.

The *Find and Replace* dialog box opens. In the Find tab, type in the data item value you seek and click the *Find Next* button. The first record that meets the search criterion is automatically selected in the field of the table. You can now edit the data in that record. You can make your search more specific using the options located in the dialog box. Clicking ***Find Next*** will take you to the next occurrence.

Wildcard Character

In Access, the asterisk (*) is a wildcard character. A wildcard is a symbol used in a search to replace unknown characters. For example, if you were searching for Oak Street but were not sure of the exact address, you could search the *Address* field for *Oak* which would retrieve every record with the word *Oak* somewhere in the address.

Steps to Find a Record

1. At a form or in a table in Datasheet View, place the cursor in the field you are searching.
2. Click on the Find button

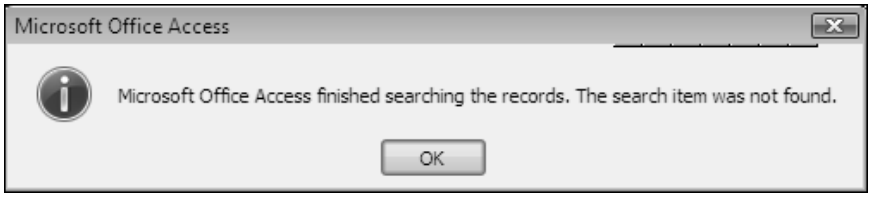
in the ribbon. The Find and Replace window displays.
3. Enter search criteria in the *Find What* field.
4. Click on the **Find Next** button to see the first matching record.
5. Click on the **Find Next** button to see the next matching record.
6. When there are no more matches, a dialog box opens. Click **OK**. **Cancel** returns you to the database.

EXERCISE – FINDING RECORDS

1. Open the *Orders* table.
2. You want to find all the orders placed by Employee *Peacock* however, you don't know the first name. Place your cursor in any record in the *Employee* field.
3. Click on the Find button

on the ribbon in the *Find* group.

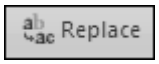
4. In the *Find What* field, type *Peacock*.
5. Click on **Find Next**. A message box tells you that there were no records found.



6. Click **OK**.
7. In the Find What field, type *Peacock**.
8. Click on **Find Next**. Access selects Margaret Peacock.
9. Click on **Find Next**. Note the current record text box on the Record Navigation Bar.
10. Click the **Cancel** button.

REPLACE OR EDIT DATA

Find and Replace

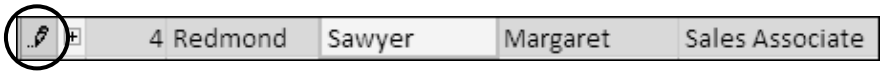


Use the *Replace* tab in the *Find and Replace* dialog box to automatically change a field entry using the steps in the previous section. Click the *Replace* Button in the *Find* Group on the *Home* tab of the ribbon.

Replace or Replace All

Follow the steps in the previous section to find the first occurrence of the data you wish to change. In the *Replace With* field enter the data change. Use the options for a more specific search. The **Replace** and **Replace All** buttons allow you to replace one entry at a time or all occurrences at once.

When making changes to a record directly in the table, a pencil icon will appear in the record selector bar (blank column at the left edge of the datasheet). The pencil icon indicates that the current record is being edited and the changes have not yet been saved. Changes to data will be saved when you move to another record in the table or click the Enter key on the keyboard.



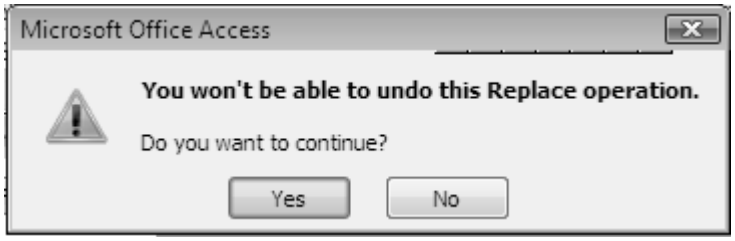
Steps to Replace Data

1. Place the cursor in the field to be changed.
2. Click the **Replace** Button in the ribbon.
3. In the **Find What** field, type the entry you want found and changed.
4. In the **Replace With** field, enter the replacement entry.
5. Click on either the **Replace** or the **Replace All** button.
6. A message box opens to confirm the change. Click **Yes.**
7. Click the Close button to close the window.

EXERCISE – REPLACING DATA

In the title field of the *Employees* table, change all occurrences of *Sales Associate* to *Sales Representative*.

1. Open the *Employees* table.
2. Click in any record in the ***Title*** field.
3. From the ribbon, click the ***Replace*** button.
4. In the *Find What* field, type ***Sales Associate***.
5. In the *Replace With* field, type ***Sales Representative***.
6. Click on the ***Replace All*** button.
7. A message box opens. Click **Yes**.



8. Click the **Close** button. Note that the change has been made.

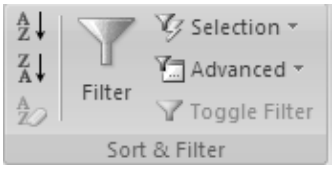
SORTING RECORDS

How and Why?

By default, records in a table are displayed alphanumerically and sorted in ascending order by the primary key field values. To reduce the time you spend searching for data, Access provides several options that will assist you in locating and viewing specified records by arranging data in a specific order. Sorting can be performed on single or multiple fields.

Single Field Sort

Click on any record in the field you wish to sort. The sort buttons are located in the *Sort & Filter* group on the Home tab in the ribbon. When you click on the **Sort Ascending** button, the records in the field are sorted in alphabetical order, A-Z. When you click on the **Sort Descending** button, the records in the field are sorted in reverse alphabetical order, Z-A.



Multiple Field Sort

You can also do a sort using more than one field. Columns may be rearranged to perform this sort. Select the columns to be sorted and then click the Ascending or Descending button. Access sorts first by the leftmost column in the selection, then by the next column, and continues this pattern for the remainder of the sort keys. Access saves the sort order when the table is closed.

Remove the Sort

To restore the records to the original order, click the *Clear All Sorts* button in the Sort & Filter group. This step must be done **before** you save the design changes.

Rules for sorting Alphanumeric Data

1. Numbers stored in fields that are not defined as numeric are sorted as character (text) data. All field values must be the same length to sort character type numbers as numbers.
2. If a selected field is empty, the record that contains it is listed first.
3. Numbers are sorted before letters.

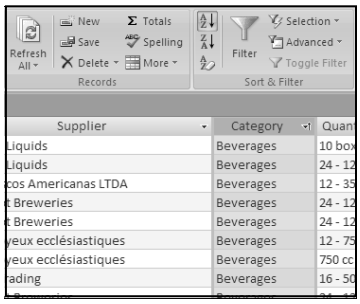
EXERCISE – SORTING A TABLE

1. Open the *Products* table. Click on the *Category* column header to select it.

2. Click on the **Sort Ascending** button on the ribbon. Note the order of the records.

3. Click on the **Sort Descending** button on the ribbon. Note the order of the records.

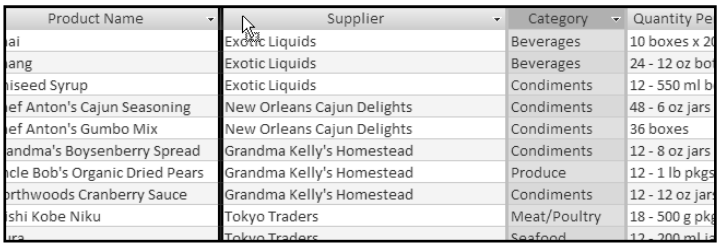
4. Restore records to their original order by clicking the *Clear All Sorts* button.



5. Now sort the *Suppliers* alphabetically within an alphabetical listing of *Categories*. In other words, for each *Category* (in alphabetical order), show each *Supplier* (in alphabetical order). As *Category* is sorted first, it must reside to the left of the *Suppliers*.

6. Position the mouse pointer in the *Category* column heading until the pointer changes to a downward-pointing black arrow and click the left mouse button. The column is now selected. Release the mouse.

7. While holding down the left mouse button, drag the *Category* column header to the left of the *Supplier* column. A thick black line appears between columns as you drag, indicating the position the new position of the column when you release the mouse.



8. Select both the *Category* and *Supplier* columns. Position the mouse pointer in the *Category* column heading until the pointer changes to a downward-pointing black arrow, hold down the left mouse button, drag right until the *Category* and *Supplier* columns are selected, and release the left mouse button.

9. Click the Ascending button, and then click in any cell to deselect the columns. The records are sorted first alphabetically by *Supplier* then alphabetically by *Category*.

10. Click on the Close button to close the Products table. Click **No** when prompted to save the changes.

Product Name	Category	Supplier	Quantity
Côte de Blaye	Beverages	Aux joyeux ecclésiastiques	12 - 75 cl
Chartreuse verte	Beverages	Aux joyeux ecclésiastiques	750 cc pe
Sasquatch Ale	Beverages	Bigfoot Breweries	24 - 12 oz
Steeleye Stout	Beverages	Bigfoot Breweries	24 - 12 oz
Laughing Lumberjack Lager	Beverages	Bigfoot Breweries	24 - 12 oz
Chai	Beverages	Exotic Liquids	10 boxes
Chang	Beverages	Exotic Liquids	24 - 12 oz
Lakkalikööri	Beverages	Karkki Oy	500 ml
Ipoh Coffee	Beverages	Leka Trading	16 - 500 g
Outback Lager	Beverages	Pavlova, Ltd.	24 - 355 m
Rhönbräu Klosterbier	Beverages	Plutzer Lebensmittelgroßmärkte AG	24 - 0.5 l b
Guaraná Fantástica	Beverages	Refrescos Americanas LTDA	12 - 355 m
Aniseed Syrup	Condiments	Exotic Liquids	12 - 550 m
Sirop d'érable	Condiments	Forêts d'érables	24 - 500 m
Grandma's Boysenberry Spread	Condiments	Grandma Kelly's Homestead	12 - 8 oz j
Northwoods Cranberry Sauce	Condiments	Grandma Kelly's Homestead	12 - 12 oz
Gula Malacca	Condiments	Leka Trading	20 - 2 kg b

APPLYING AND REMOVING FILTERS

Viewing Subsets of Data

Database tables store large quantities of data. You may need to see only a portion of that data; for example, one state or one city or sales from one customer. Using the *Find* option to manually check through an entire table is tedious at best and not very efficient.

Using the filter feature, you can display an entire subset of data from your table. The records that do not meet the filter criteria are temporarily hidden from view. You can apply a filter to data that has been filtered; multiple filters can be applied to a table at the same time.

Filtering Options

The *Sort & Filter* group on the *Home* tab in the ribbon has three options – the *Selection* drop-down list, the *Advanced* drop-down list, and the *Toggle Filter* button.

Option	Description
	Allows you to filter items depending on the value of the selected item. If you are filtering by a Name field, the options list includes selecting "equals" "not equals", "contains", or "does not contain" the value of the item selected.
	Allows you to filter multiple fields in a form, apply filters that are not commonly available in the filter list, or save your filter as an actual query object in the database.
	Used to move between the filtered and unfiltered view of data in the table.

Filters can be Saved

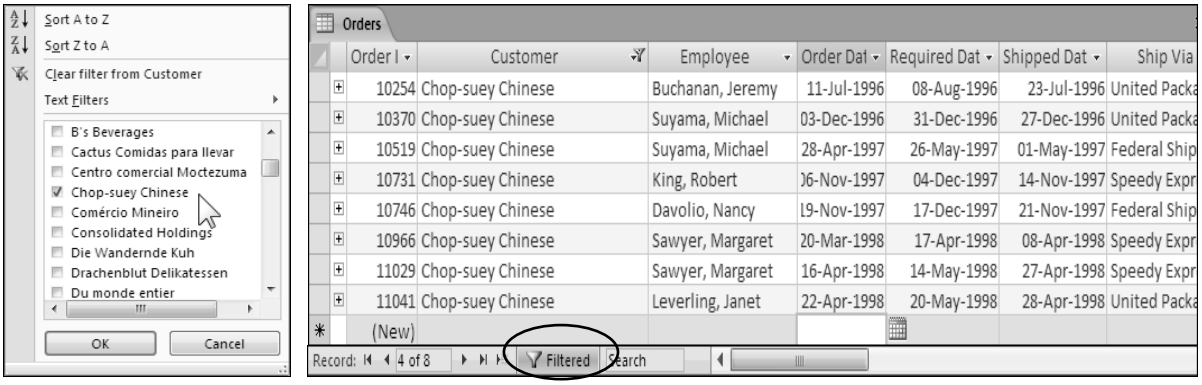
Filters can be saved as a query and stored as an object in the database.

Steps to Save the Filter as a Query

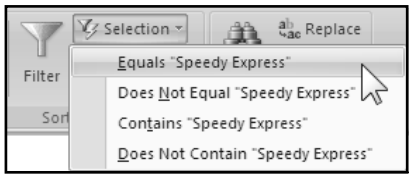
1. Filter the records in the desired table.
2. Click the Office button and choose Save As to display the Save As dialog box.
3. In the Save As dialog box, Name the query in the Save To textbox.
4. From the As drop-down list, select Query. Click OK.

EXERCISE – FILTERING BY SELECTION

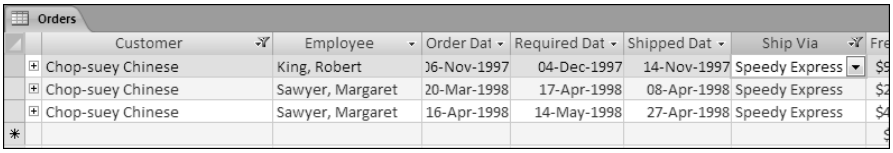
1. Click the *Orders* tab.
2. Place your cursor on any record in the *Customer* field.
3. Click on the ***Filter*** button on the ribbon. Access provides a drop-down list in the active column and includes in the filter list box each unique field value that exists within the column. Adjacent to each field value is a check box. Clear the checked field (uncheck the ***Select All*** checkbox). Check the box labeled ***Chop-suey Chinese***. When you click OK, only those records with a matching field value are displayed. All other records are temporarily hidden.


Sort A to Z
Sort Z to A
Clear filter from Customer
Text Filters
B's Beverages
Cactus Comidas para llevar
Centro comercial Moctezuma
Chop-suey Chinese
Comércio Mineiro
Consolidated Holdings
Die Wandernde Kuh
Drachenblut Delikatessen
Du monde entier
OK
Cancel
Orders
Order I
Customer
Employee
Order Dat
Required Dat
Shipped Dat
Ship Via
10254 Chop-suey Chinese Buchanan, Jeremy 11-Jul-1996 08-Aug-1996 23-Jul-1996 United Packa
10370 Chop-suey Chinese Suyama, Michael 03-Dec-1996 31-Dec-1996 27-Dec-1996 United Packa
10519 Chop-suey Chinese Suyama, Michael 28-Apr-1997 26-May-1997 01-May-1997 Federal Ship
10731 Chop-suey Chinese King, Robert 06-Nov-1997 04-Dec-1997 14-Nov-1997 Speedy Expr
10746 Chop-suey Chinese Davolio, Nancy 19-Nov-1997 17-Dec-1997 21-Nov-1997 Federal Ship
10966 Chop-suey Chinese Sawyer, Margaret 20-Mar-1998 17-Apr-1998 08-Apr-1998 Speedy Expr
11029 Chop-suey Chinese Sawyer, Margaret 16-Apr-1998 14-May-1998 27-Apr-1998 Speedy Expr
11041 Chop-suey Chinese Leverling, Janet 22-Apr-1998 20-May-1998 28-Apr-1998 United Packa
(New)
Record: 4 of 8
Filtered
Search

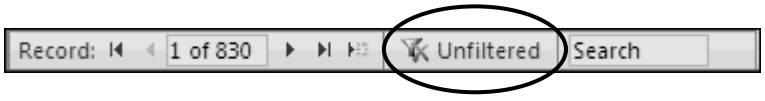
4. The *Record Navigation* Bar indicates that the data is filtered.
5. This customer is having problems with shipments from ***Speedy Express***. Filter out those records so that we can focus on them. Choose a *Speedy Express* record from the column *Ship Via* in the display. Click the Selection button in the Filter & Sort group. Click *"**Equals "Speedy Express"***.



6. The new filter is applied. There are only three records displayed.



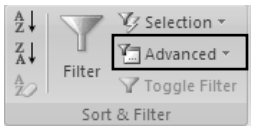
7. To **cancel** the above filters and restore the table to its original view, click the Toggle ***Filter*** button. The *Record Navigation Bar* now indicates that the records are unfiltered.



FILTER BY FORM

Complex Filters

This feature is useful for filtering several fields or for locating a specific record. Access creates a blank datasheet with the same structure as your original datasheet and allows you to specify search criteria for one or more fields.



For Example, if one of your customers is having problems with a particular shipper, display all shipments from this shipper to this customer. The first step is to open the *Customers* table and click the *Advanced* button in the *Sort and Filter* group on the ribbon. Select *Filter by Form* from the drop-down menu list.

You cannot specify field values for multivalued fields using this filter. Fields with Memo, Hyperlink, Yes/No, or OLE object data types are also prohibited.

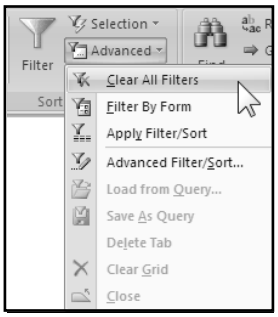
Apply Filter

Enter the first set of values, then click the *Or* tab and enter the next set of values. Each *Or* tab represents an alternate set of filter values. To apply the filter, click the Toggle Filter button in the *Sort & Filter* group. Access will show only those records that match your input.

Undo the Filter

To undo a filter, click the Toggle Filter button again. To see the full view of the data, click the filtered button on the Record Navigation Bar.

Remove or Reapply a Filter



To remove the filters:

1. Click Filtered on the Record Navigation Bar to return to the full view of data.
2. Click the Advanced button on the ribbon and choose *Clear All Filters* from the drop-down list.

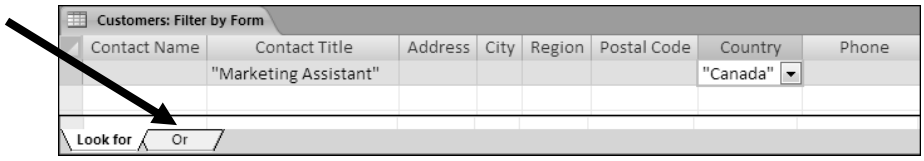
When you remove the current filters, the filters are temporarily removed from all of the fields in the view **until you clear them**. To reapply the most recent filters:

1. Click Unfiltered on the Record Navigation Bar.
2. The filter will be available as the most recent until all filters are cleared.

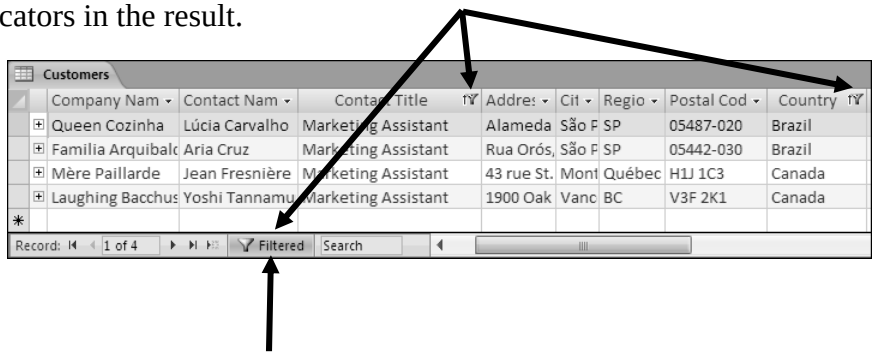
EXERCISE - FILTERING BY FORM

Contact all **Marketing Assistants** in **Brazil** and **Canada** about new marketing procedures.

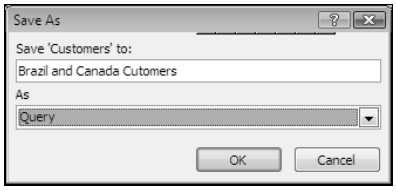
1. Open the *Customers* table.
2. Click the *Advanced* button in the *Sort and Filter* group on the ribbon. Select *Filter by Form* from the drop-down menu list.
3. Using the pull-down menus, click *Marketing Assistant* from the *Contact Title* column and select *Canada* from the *Country* column. We also need marketing assistants in *Brazil*. Click the *Or* tab at the bottom of the window. Again, using the pull-down menus, place *Marketing Assistant* and *Brazil* in their respective columns.



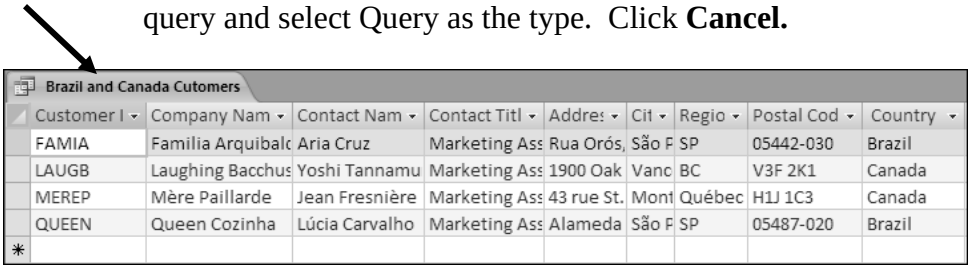
4. To apply the filter, click the *Toggle Filter* button on the ribbon. Notice the Filtered indicators in the result.



5. Click the *Filtered* button on the Record Indicator Bar to temporarily remove the filter. To reapply the most recent filter, click on the *Unfiltered* button.



6. To save the filtered data as a query, click the Office button and choose Save As to display the Save As dialog box. Name the query and select Query as the type. Click **Cancel.**



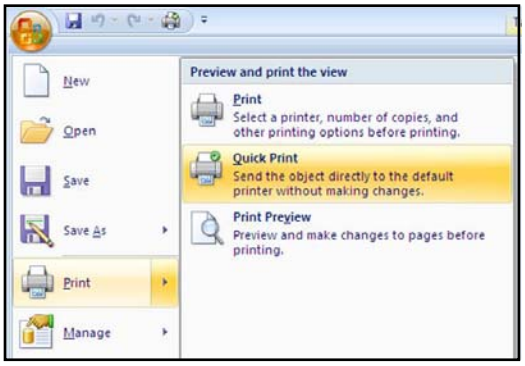
7. Remove the filter from the *Customer* table by clicking the *Toggle Filter* button.

PREVIEWING & PRINTING – FORMATTING THE DATASHEET

Print Options

Access 2007 has several options for printing the datasheet view. **Quick Print** will send the object to your default printer without changing any print settings. The **Print Preview** command lets you see how your data will look on the printed page and assists in changing layouts before printing. The **Print** command allows you to make changes to the layout before you print an object.

Click the Microsoft Office button, and then click Print. The Print dialog box appears.



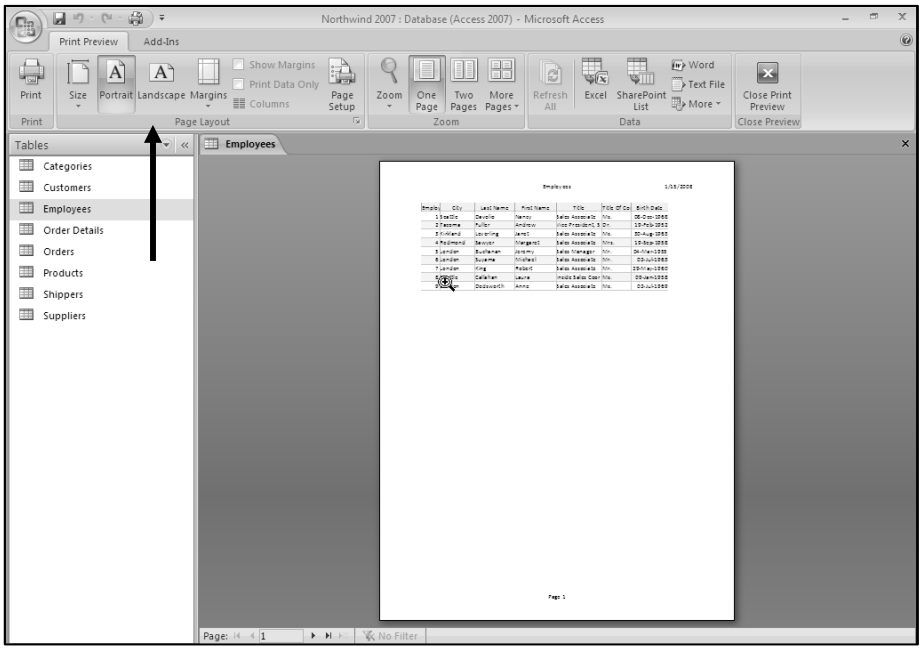
Printing Items in a Datasheet (*Access Help facility*)

To Select	Do This
Data in a field	Drag across the data to select.
An entire field	Click the left edge of the field where the pointer changes to a white plus pointer.
Adjacent fields	Drag from the left edge of a field across the fields that you want to select.
A column	Click the column header.
Adjacent columns	Drag from the field name at the top of the column across the columns that you want to select.
A record	Click the record selector of a row.
Multiple records	Drag from the record selector of the first record across the records that you want to select.
All records	Click the down arrow on the Select button in the Find group on the Home tab, and then click Select All.

EXERCISE – EDITING IN DATASHEET VIEW

1. Open the *Employees* table.

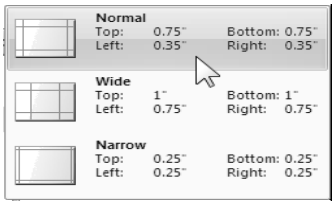
2. Click the *Microsoft Office button*, and then point to *Print*. The Print dialog box appears. Click *Print Preview*.



3. The mouse pointer is a zoom tool. Click to magnify the image.

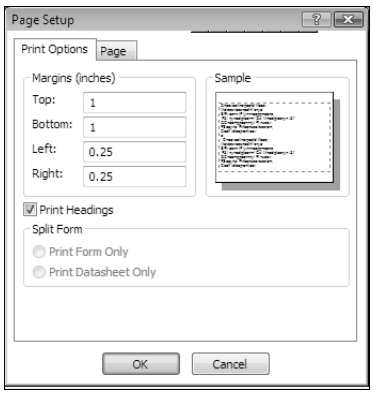
4. Click the *Next Page* button located on the *Navigator bar* to view all pages. Note that the *Employees* table is split across multiple pages with the default margins and orientation. Change the format and orientation so that the datasheet will fit on one page.

5. Click the *Landscape* button in the *Page Layout* group of the *Print Preview* tab. While the Landscape orientation allows more columns to fit on a page, it still requires 3 pages to fit the datasheet. Another method to fit more text on a page is to reduce the margins.



6. Click the *Margins* button in the *Page Layout* group. The drop-down list shows the predefined margin options. You can set your own custom margins if none of the predefined margin settings are appropriate for your data.

7. Click outside the options list to remove it. Click the *Page Setup* button in the *Page Layout* group. The *Page Setup* dialog box appears. On the *Print Options* tab, change the left and right margin settings to 0.25. Click OK. Changing the margins did not allow the datasheet to fit on one page. We can now format the datasheet to reduce the number of columns shown.

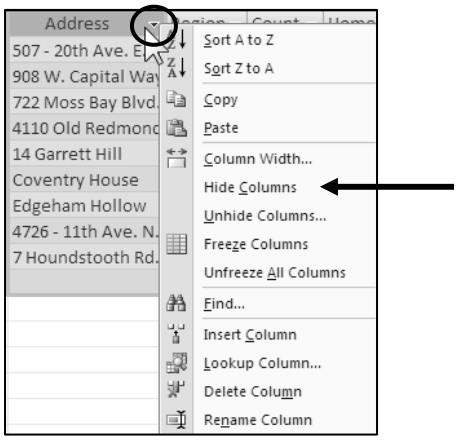


EXERCISE – EDITING IN DATASHEET

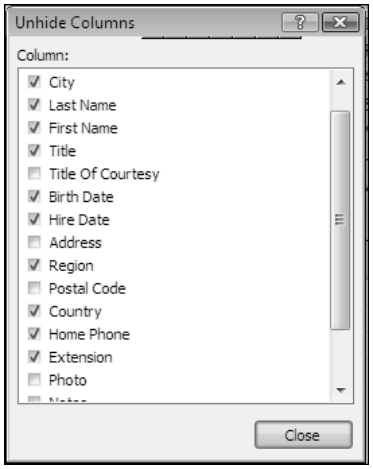
8. *Close Print Preview* by clicking the button in the *Close Preview* group.

9. You have decided that not all of the data on the datasheet needs to be printed. By hiding columns, they are temporarily unavailable for viewing.

10. On the *Employee* table *Address* column, right-click the pull-down menu and select Hide Columns. Also hide *Employee ID, Title of Courtesy, City, Region, Postal Code, Photo,* and *Notes* columns.



11. To select multiple columns at the same time, right-click any column pull-down and select *Unhide* columns. A list of columns in the datasheet is shown along with a checkbox. Uncheck those columns that you wish to temporarily hide from view. Click ***Close***.



12. Preview the datasheet. The datasheet now fits on one page. Click the *Print* button to print the datasheet.

13. If more formatting needs to be done, close the preview to return to the datasheet view. You can change the font size and type using the options in the *Font* group on the *Home* tab.

14. To return the datasheet to its original layout format, right click on any column header pull-down menu and select *Unhide Columns*. Check all boxes.

NOTES

TABLES – TAKING CONTROL WITH DESIGN VIEW

Table Structure

The database table displays the fields that describe the records in the datasheet view. In addition, each field has a data type which is used to ensure the integrity of the data. The field name, its data type, the field description, and the field properties are all used in defining the *table structure*. The table structure is documented and displayed in **Design View**.

Self-Describing

The fact that the database not only contains data, but also includes a description of its data, is one of the biggest advantages of database technology. You do not need to search for a separate manual when you have questions about the design of your database. That information is contained within the database itself.

Design Control

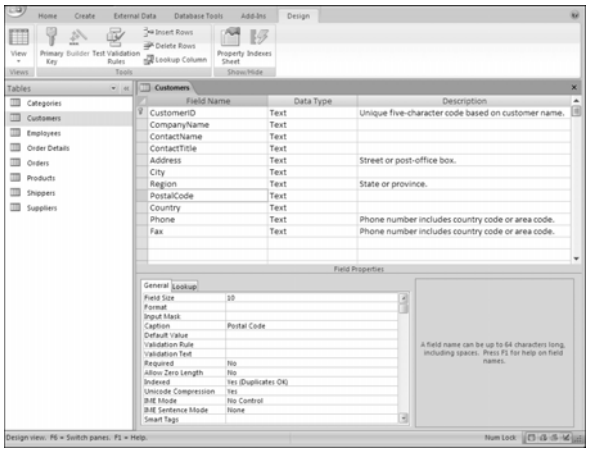
Although a new table can be created by simply typing new records into a blank datasheet, creating a table in Design view allows **you** to set data types and design properties. In Design view, Access does not add the ID field or set data types for the new table automatically. Once the data is in the table and the rules are set by Access, they may be difficult to change. Using Design view gives you total control in defining the table structures.

Editing a Table in Design View

Change	Procedure
Open table	In the Navigation Pane, double-click a table name to open it in datasheet view. Click the Design view button.
Make changes	Modify the Data Type and Field Description by placing your cursor in that field and typing the change. **Use caution when changing data types of populated fields.**
Add a new field	Place your cursor in the first empty row at the bottom of the field list and type the new field information.
Insert a field	Create a blank row by placing the cursor in the row below the insertion field and clicking on the *Insert Rows* button in the *Tools* group on the *Design* tab.
Move a field	Select a row by clicking on the record indicator (the gray shaded bar at the far left of the row) and releasing the mouse. Then click and hold the mouse pointer on the record indicator to display a solid line above the selected record. Drag the field to the desired position.
Delete a field	Select the row by clicking the record indicator. Press the delete key. **Pay close attention to the warning message**.

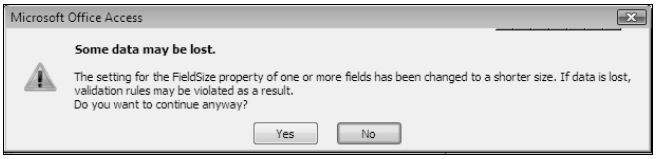
EXERCISE – EDITING IN DESIGN VIEW

1. Select the *Customers* table and click on the **Design** button.



2. Change the *PostalCode* field name to *ZipCode*.

3. Change the *Phone* Data Type to *Number*. **Save**.


Microsoft Office Access
Some data may be lost.
The setting for the FieldSize property of one or more fields has been changed to a shorter size. If data is lost, validation rules may be violated as a result.
Do you want to continue anyway?
Yes
No

4. You are attempting to change the structure of your database. Weigh the consequences ***carefully*** before committing the changes. Click **No** in the warning message. Click the pull-down menu in the Data Type column of the *Phone* field and select *Text*.

5. Place your cursor in the first empty row at the bottom of the table. Enter:

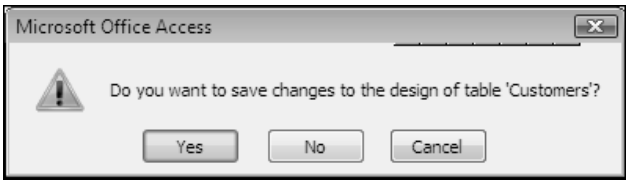
   Field Name: ContactAddress
   Data Type: Text
   Description: Form of address (Mr., Mrs., etc.)

6. Select the new row by clicking on the record indicator and release the mouse. Re-click the record indicator and while holding the mouse key down, drag the field below the *ContactName* field.

7. Click the Fax record indicator to select the row. Click the *Insert Rows* button in the Tools group of the Design tab.

8. Select the new blank row. To delete the row press the delete key or click the *Delete Rows* button in the Tools group of the Design tab. We do not need to add a field here.

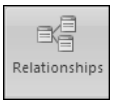
9. Click the **Close** button to close the table. Click **No**.



10. We will address field properties and other Design view options later in the course.

RELATIONSHIPS

Related Data



Access is a *relational* database management system. The database consists of several subject-based tables. Data may be retrieved from several tables when generating reports or requesting information. Table *relationships* allow data in tables to be joined to bring the information together as needed.

Linked Tables

After your tables are created they must be linked together. This is established through a linking field or a common field between the tables. Depending on how the tables are related will determine the type of relationship required.

Referential Integrity

When creating relationships, one table is typically the primary table with the second being the related table. When the tables are joined based on a common field between the two, Access ensures the integrity of the data. For example, *Order* information (related table) for a C*ustomer* (primary table) will not be allowed into the database unless the customer exists. In other words, only customers in your database are allowed to have orders. Trying to find or *reference* a non-existing customer for an order would create an *orphan* order. Referential integrity is used to prevent orphans and keep references in sync so that the above situation never occurs.

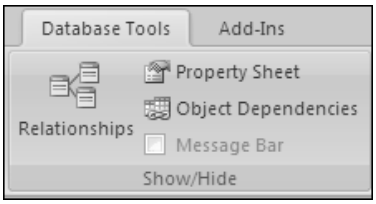
Access creates relationships based on the common field that was used to join the tables. We will create relationships later.

Types of Relationships

Relationship	Description
One-to-one	The common data appears only once in both tables.
One-to-many	The common data appears once in the primary table, but many times in the related table.
Many-to-many	The common data can appear many times in both tables. A third table must be created to reduce the redundancy of the data and to create two one-to many relationships.

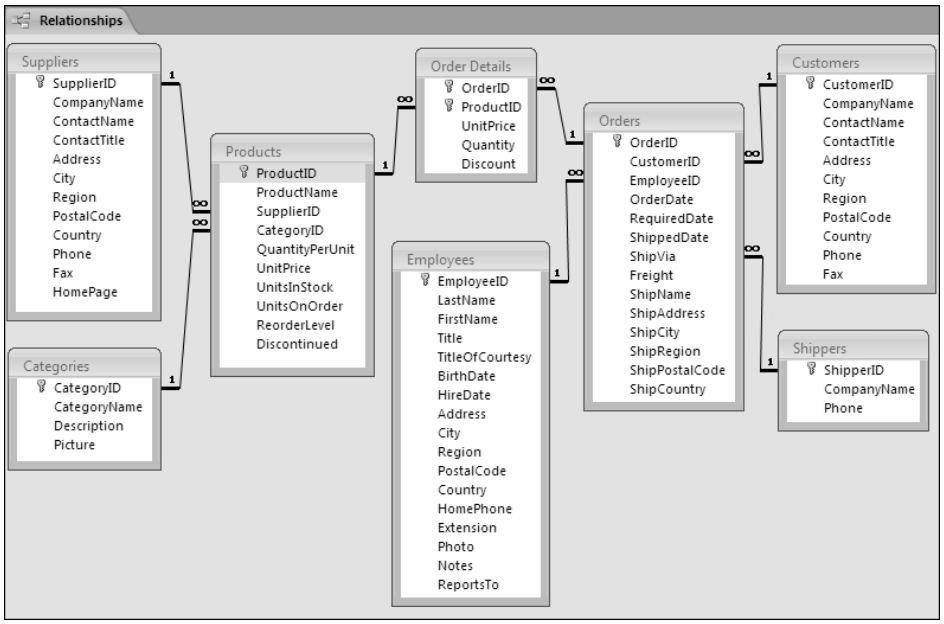
EXERCISE – VIEW RELATIONSHIPS

1. Close any tables that are currently open. Click **No** to saving any changes.
2. On the *Database Tools* tab in the *Show/Hide* group, click the *Relationships* button.



3. Click the *Shutter bar* on the *Navigation pane* to close it.

Each table is related to at least one other table in the database. Data can be retrieved through all of these relationships. The common field has the same name in both tables however; this does not have to be the case.



All relationships in the diagram are one-to-many – the infinity symbol (∞) shows the many side of the relationship. To read the relationship between two tables (*Customers* and *Orders* for example):

A Customer can have many Orders. A specific Order is for only one Customer.

DELETING OBJECTS IN ACCESS

Exercise Caution!

In a multiuser environment, deleting any object from the database should be performed only by those authorized to do so – in most cases, once an object has been deleted, the result is permanent. Even the Undo button cannot help you recover data that has been deleted.

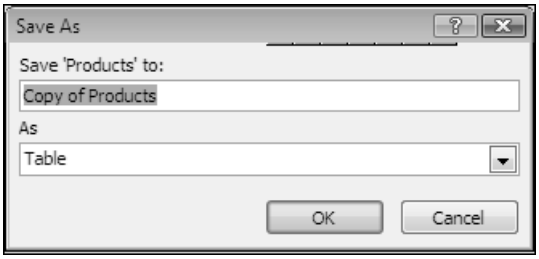
Access is a relational database. Data in the deleted table could be linked to other tables thus, creating orphans. For example, a *Customers* table has related records in an *Orders* table. If a customer is deleted, all of those customer's orders become orphans. All data about the customer for those orders is lost and the integrity of the data is compromised.

Warning Message

When you try to delete an object in Access, you will receive a warning message reminding you of the consequences if the action is taken. Every object has a different set of consequences. Be sure to thoroughly read each warning message. In most cases, you will not be able to recover the data.

Make a Copy

Before deleting an object from the database, even if you have removed all relationships for that object, it's a good idea to make a copy. To copy a table, select the table from the Navigation bar. From the *Office* button, select *Save As/Save Object As*. The Save As dialog box opens. You can rename the table and click OK.



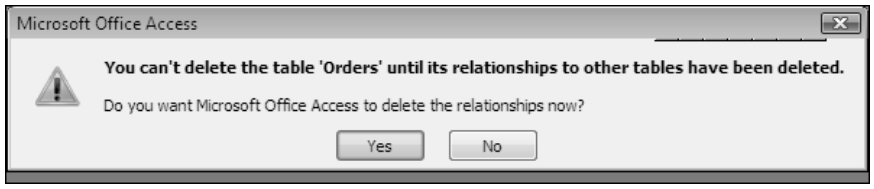
Steps to Delete a Table in Access

1. Make a copy of the table.
2. At the Navigation Bar, select the table to delete.
3. Press the delete button in the Records group on the Home tab.
4. Pay close attention to the warning message box.
5. Click OK to delete the table.

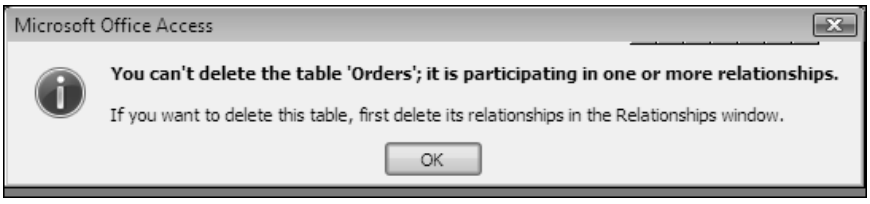
EXERCISE – DELETING A TABLE

1. Close all tables in the database.

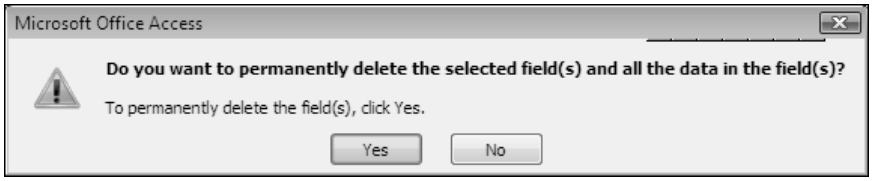
2. Click the *Orders* table to select it. On the *Home* tab of the ribbon in the *Records* group, click the *Delete* button. Depending on the relationships of the *Orders* table, you will get one of several warning messages.


Microsoft Office Access
You can't delete the table 'Orders' until its relationships to other tables have been deleted.
Do you want Microsoft Office Access to delete the relationships now?
Yes
No

Click NO. Always delete relationships manually.

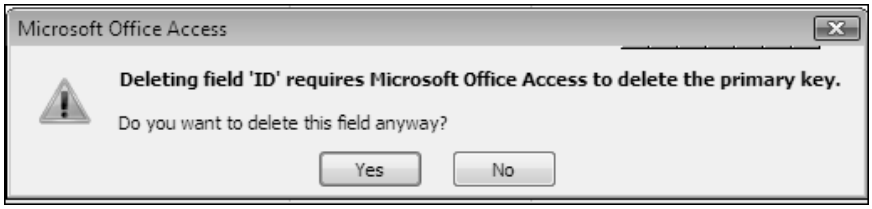

Microsoft Office Access
You can't delete the table 'Orders'; it is participating in one or more relationships.
If you want to delete this table, first delete its relationships in the Relationships window.
OK

Click OK.


Microsoft Office Access
Do you want to permanently delete the selected field(s) and all the data in the field(s)?
To permanently delete the field(s), click Yes.
Yes
No

Click NO.

3. When deleting a field that has been specified as the primary key, the following message appears. The primary key is the field that guarantees all records in your table are unique and ensures that there are no duplicate records in your table. It is not a good idea to delete the primary key field.


Microsoft Office Access
Deleting field 'ID' requires Microsoft Office Access to delete the primary key.
Do you want to delete this field anyway?
Yes
No

Click NO. Close the database.

DESIGNING THE DATABASE

Don't Skip This Step!

You have now examined an Access 2007 database and its components. Your database design will depend on the purpose for which it is created and the data it will contain. A well designed database will provide current accurate information that is easily maintained.

The *Database Design Process* is used to help you create the best design for your needs. A good database design follows several guidelines. Below are just a few:

Principle	Guidelines
Duplicate Information	Also referred to as *redundant* data. Keep to a minimum to avoid wasting space and to decrease the likelihood of errors and inconsistencies.
Subject-based Tables	Keep table information simple – do not include information in a table that does not describe the table. This reduces redundant data.
Uniqueness	All records in a table must be unique. This is accomplished through the **primary key**. Also reduces redundant data and decrease possible errors when modifying the database. The primary key must never be blank for any record.
Relationships	Because data is kept in its simplest form to reduce redundancy, it is necessary to combine data from several tables when creating reports or requests for information. Setting up the method for combining data in different tables through relationships ensures the accuracy and integrity of your information.
Similar Records	All records belonging to a table takes on the same format, size, and field names. Too much missing information in a record suggests that the data may belong in a different table.
Allowable Values	Each field has a set of allowable values ensuring the validity of the data.

Design Process

The database design process consists of several steps:

1. Determine the purpose of your database.
2. Gather existing data and make a list of required fields.
3. Arrange the data into tables.
4. Use **sample** data to troubleshoot for possible problems such as reducing redundant data.
5. Identify primary keys and specify foreign keys used to relate tables.
6. Determine table relationships and revise the table design as necessary.

DESIGNING THE DATABASE

Go Team!

Database design is very much a **Team sport**. Because the database is a shared resource, input from each person and department using the database is essential to ensure its completeness. While data can be added after the initial design is complete, it is much harder to modify your database structure. Depending on the modifications, it may be easier to destroy your design and start over!

Example: Books4U

In the pages that follow, we will be using an example of a bookstore's database to illustrate the concepts described here. Picture in your mind any bookstore that you frequent. It could be the bookstore in the mall, or the college bookstore on campus. Close your eyes and look around at the items contained within. Bookstores today sell much more than just books; CDs, DVDs, magazines, games, stationary, cards, pens, and don't forget the coffee bar in the corner! To keep the application from getting too complex, our bookstore, ***Books4U***, supplies only books. Our task is to design a database to capture all relevant data for our business.

1. Purpose

A statement that defines the scope of our database will help to guide its design. It will imply the **general** kinds of data to be included as well as who the users will be. *Specific* queries, forms, or reports are not stated.

The Books4U database will keep information on the books we sell, the customers we sell to, the vendors we purchase from, the shippers we use to deliver book purchases by mail, and the employees of our store. We will need to track sales for quarterly and yearly financial records. All employees will have access to book information. Management will use data to calculate yearly sales earnings.

2. Gather Information

Start with existing information keeping in mind the end result. Gather those documents that are required for day-to-day business operations such as sales slips, purchase invoices, books lists, and customer information. Include spreadsheets, printed documents, index cards, and any other paper or electronic format used.

List each item that comes to mind. Don't worry about including everything perfectly at first. Be sure to get input from everyone who will be using the database.

Consider the types of reports that you will want the database to generate. Are there inquiries for your product that come up often, such as book prices, quantity on hand, publisher information, or release dates for new books that you need to access quickly? Do you need to store pictures, logos, comments or perform calculations?

Preliminary List of Required Data

ISBN	Order #	Sales Date	Publisher Contact
Title	Order Date	Supplier Name	Shipper Name
Publisher Name	Purchase Date	Supplier Address	Shipper Address
Qty	Discount Price	Supplier Phone	Shipper Phone
Cost	Employee #	Supplier Contact	Shipper Contact
Price	Pay Rate	Employee Name	Credit Card #
Customer Name	Start Date	Employee Address	Book Category
Customer Address	Birth Date	Dependents	Total Amount
Customer Phone	Author	Publisher Address	Item #
Contact	PO #	Publisher Phone	Qty On Hand

3. Arrange Data Into Tables

The above list is a subset of the data required for *Books4U*. Each data item describes or is part of an *entity* in our business. For example, ISBN is an identifier that describes **Books**. Title also describes Books. Birth Date describes **Employees**. Order # is part of the **transaction** process of purchasing a book.

The *entities* become the subjects of our *tables*. The *data items* that describe the table entity become the *fields* of that table. Keep field data as simple as possible to allow for sorting flexibility. For example, it becomes complex to request a sort on cities when city is part of an address field. Keep the city data item separate to facilitate a more efficient search. The same is true for the Name field. Separate first name and last name to allow an alphabetical listing of customer's last name.

Include only those fields that describe the table. For example, credit card may mistakenly be placed in the Customers table when in fact it is part of the process of a Sales Transaction.

Books	Customers	Transactions	Employees
ISBN	First Name	Customer Name	First Name
Title	Last Name	Customer Address	Last Name
Author	Address	Date	Birth Date
QtyOH	City	Employee Name	Hire Date
Price	State	ISBN	Department
Publisher#	Zip	Qty	Title
		Price	
		Total	

4. Use Samples to Troubleshoot Problems

The lists above show 4 possible table designs for our database. The data in *Books, Customers,* and *Employees* follow design guidelines. Each field describes the entity of the table, the data items are in their simplest form and it appears that each field will have one value. For example, a *Book* has only one price, a *Customer* has only one address, and an *Employee* has only one title.

The Transaction table contains data that will cause problems for database maintenance. First, you should not store the results of calculations in tables as is the case with the Total field. Access can perform the calculation when you want to see the result. Access will calculate this total each time the report is printed. This ensures that you receive the most current data each time.

Information should be stored in its smallest form. Customer Name should be separated as first name/last name. However, customer first and last names are already stored in the *Customers* table. When we relate the tables, we will resolve this situation.

The current design for *Transactions* will cause unnecessary duplication of data. For example, consider a situation when a customer purchases several books at the same time.

Name	Address	Date	Employee	ISBN	Qty	Price
Jones	123 Any St.	1/27/08	Smith	0145879	1	14.95
Jones	123 Any St.	1/27/08	Smith	2587468	1	21.45
Jones	123 Any St.	1/27/08	Smith	4258713	1	11.99

The transaction entries for this purchase create unnecessary duplicate data. Name and address are already stored in the *Customers* and *Employees* tables. Name, address, and date, are repeated for each book purchased on this transaction. We need to revise our design.

The problems arise in the Transaction table because there are two subjects being represented: the **transaction** and the **items** on that transaction. We need to separate them.

The transaction data should describe characteristics about the transaction: date, customer, the shipper, and the employee. The transaction items include ISBN, qty, and price. The modified design is shown below:

Transaction Table

Transaction #	Customer #	Date	Employee #
12546	C02	01/31/08	E05

Transaction Detailed Items

Transaction #	ISBN	Qty	Price
12546	0145879	1	14.95
12546	2587468	1	21.45
12546	4258713	1	11.99

Our modified design shows the *transaction #* as the only duplication. However, this is a **necessary** duplication as it links the two tables together and creates a relationship. More about this later.

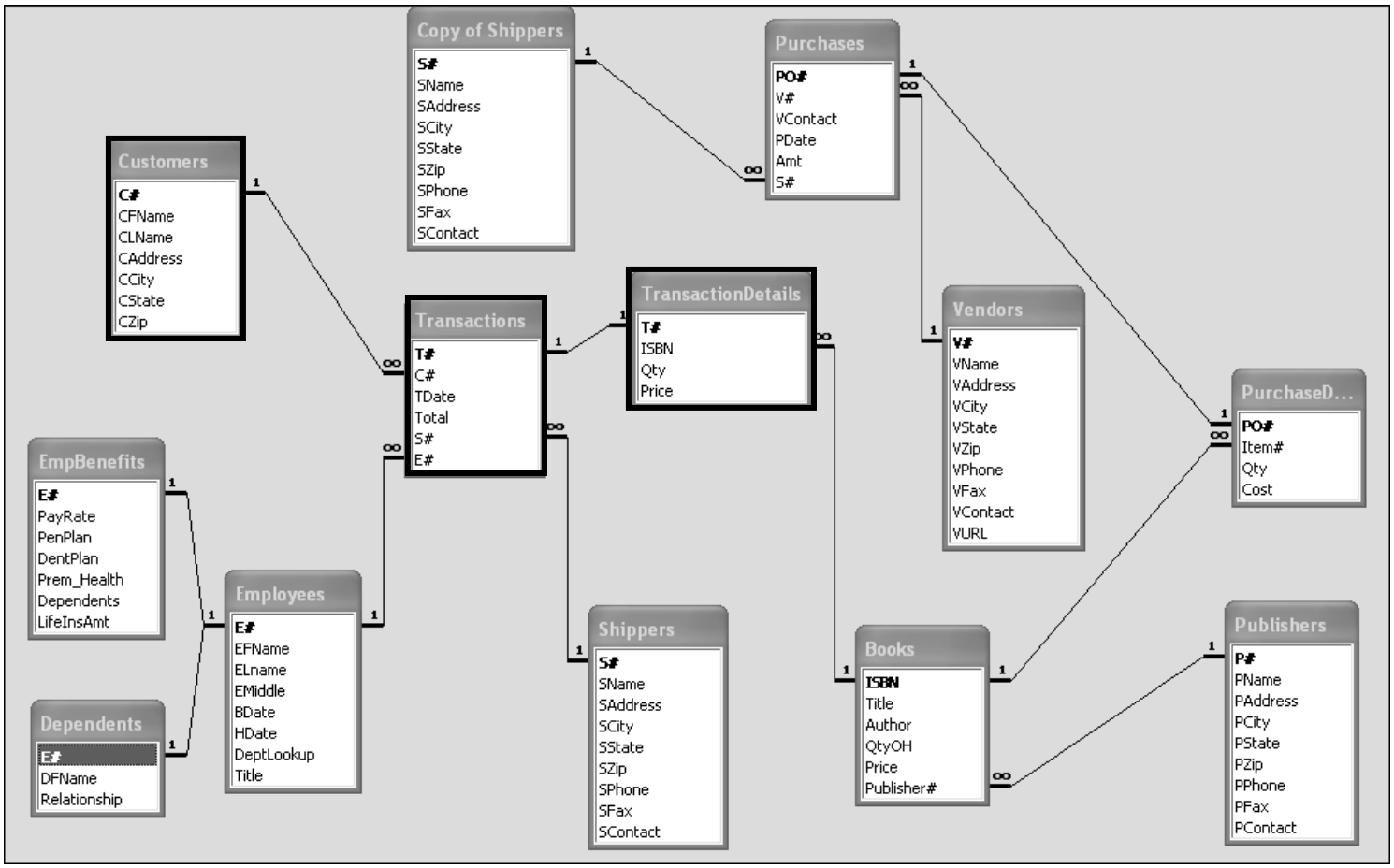
5. Identify Keys

Each table should include one or more fields identified as the ***Primary Key*** field. The Primary key ensures that all records in the table are unique and thus reduces **unnecessary** data redundancy. The primary key field for the *Transaction* table is transaction #. What is the primary key for the *Transaction Detailed Items* table?

6. Determine Table Relationships

In a relational database, information is divided into separate subject-based tables. Table relationships are used to bring the information together as needed. In the above example, transaction # is used to relate *transactions* and *detailed items*. Notice that in the transaction table, customer information is represented by only customer #. If we know the customer # we can go to the *Customer* table and retrieve that entire customer's information. To make this relationship complete, add customer # to the *Customer* table.

EXERCISE – UNDERSTANDING RELATIONSHIPS



Once you have determined the table relationships, test your design for any problems that may occur in retrieving the data. How do you navigate through the database to answer the following questions?

1. What is the name of the customer who purchased *The Seeker*?
2. On July 15, 2007, who sold the most copies of *Harry Potter and the Deathly Hallows*? What is their current salary as we need to give them a raise?
3. That book shipment that came in *today* was damaged. Find out who shipped it and get the contact info so that we can file a claim. Let the vendor know which books were damaged.

For the remainder of this workshop, we will develop the outlined tables above for the Books4U database.

CREATE A NEW DATABASE

Start Fresh

Thus far, we have viewed an existing database and examined the process of database design. In the following sections, we will develop and implement the five tables outlined in the relationship diagram of the design section.

When you close a database, or launch Access 2007, the *Getting Started* welcome screen is displayed. There are three options to opening a database. We followed the third option, *Open Recent Database* to get acquainted with the Northwind database. Another option is to open a database using a template. We will not be using a template in this course. More information on templates can be found in Appendix B.

Auto Save

To create a new database, click the *Blank Database* button under the *New Blank Database* section of the *Getting Started* screen. You are then prompted for a database name. Access 2007 will save changes to your database as you work and will use this name during development. To change location of the file, click *Browse* next to the *File Name* box, browse to and select the new location and then click OK.

Access 2007 database file names end with the file name extension .accdb and this is added to your file name. Click the *Create* button.

Steps to Create a New Database

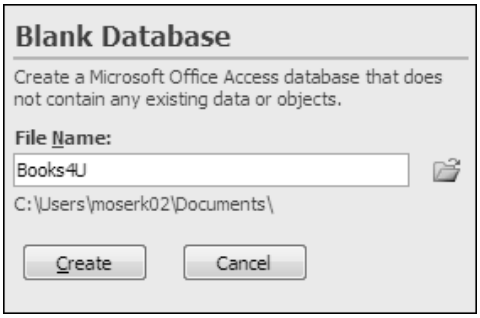
1. At the Getting Started welcome screen, click the Blank Database button under the *New Blank Database* section.
2. Type in your database name in the *Blank Database* pane.
3. Change the location of your file by clicking on the Browse icon next to the File Name box. Select the new location and click OK.
4. Access 2007 will add the extension (.accdb) to your file name.
5. Click the **Create** button.

EXERCISE – CREATING A NEW DATABASE

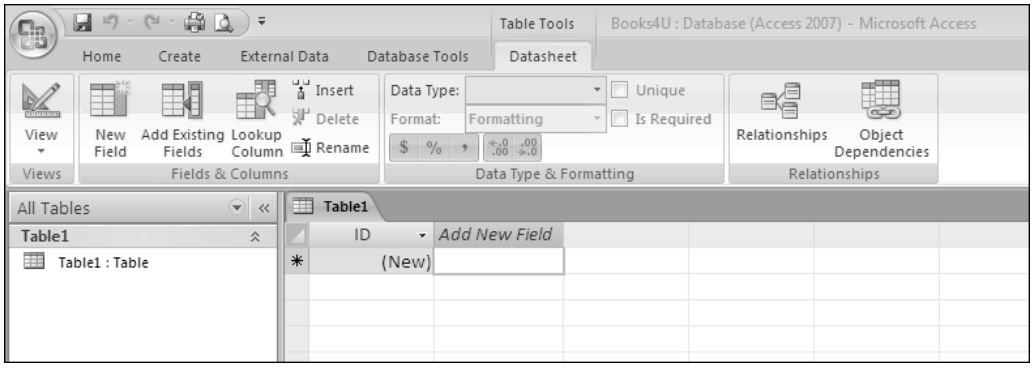
1. Close the Northwind database. Click the *Office button* at the top left of the screen and then click *Close Database*.

2. Click the *Blank Database* button under the *New Blank Database* section of the *Getting Started* screen. You will be prompted for a database name.

3. In the *Blank Database* pane type **Books4U** in the *File Name* box. Click the file icon to the right of the file name box to place the location of your database in the *Access 07 Class* folder on the desktop.



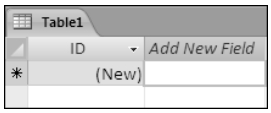
4. Click the **Create** button.



CREATE A TABLE

Creating a New Table

Access 2007 will open a new table under the *Datasheet* tab called **Table1.** The *Navigation Pane* shows the category *All Tables* with Table1 listed. Although a new table can be created by simply adding records to the blank datasheet, creating a table in *Design View* allows **you** to set data types and design properties. Design view gives you total **control** in defining table structures.



When Access 2007 opens the new table in *Datasheet* view, the cursor is positioned in the first empty cell in the *Add New Field* column. An *ID field* is automatically added to the table. Begin typing to add data. Entering data is similar to entering data in an Excel spreadsheet however, data must be entered in contiguous rows and columns, starting at the upper-left corner of the datasheet. Do not format the data by including blank rows or columns. The visual presentation of your data will be done in forms and reports.

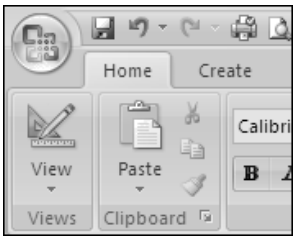
Table Contains Only Data

The table structure is created while you enter data. Access 2007 sets the data type of the field based on the type of data that you enter. If this is not correct, it may be difficult to change the data type after data has been entered into the table.

New Table in Design View

By starting in *Design View*, you set the data types and field properties the way you need them, and then add data later. Access 2007 does not add the ID field to the new table automatically. You have more control in setting the primary key field and the overall table structure.

To open Table1 in *Design View*, on the *Home* tab in the *Views* group, click on the *Design View* button. You will be asked to save the table. At this point, give the table a name and click OK.



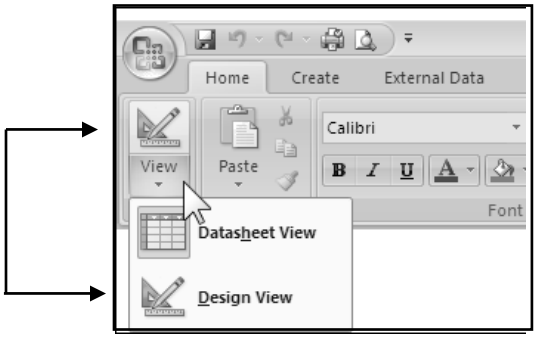
Steps to Create a New Table in Design View

1. Click the *Create* tab on the ribbon.
2. Click the *Table Design* button in the *Tables* group.

EXERCISE – CREATING A NEW TABLE IN DESIGN VIEW

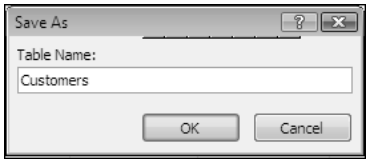
1. *Table1* has been created and is currently displayed in *Datasheet* View.

2. On the ribbon, make sure that the *Home* tab is active. In the *Views* group, click the *View* button drop-down list.



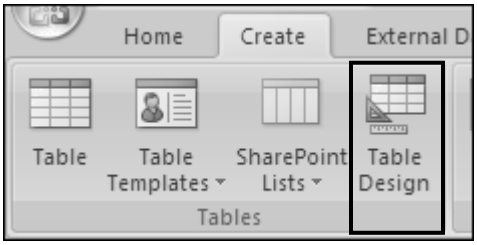
3. The *Design* View icon is the default display. Click *Design* View. Notice that the View button is a toggle between the *Datasheet* and *Design* Views.

4. You will be asked for a permanent table name to continue. Type ***Customers*** and click OK.



5. To create a new table in *Design View* directly, make sure that the *Create* tab is active on the ribbon.

6. In the *Tables* group, click the ***Table Design*** button.



7. The Design View for Table1 opens.

DEFINING FIELDS

Creating Data Structure

When creating a table in Design View, you are creating the table's structure. Once you've defined information about the table's fields, you can switch back to Datasheet View to enter your data.

Field Name

For each field in your table, you will define a field name, a data type, and an optional description. The field properties section in the lower half of the work area displays the properties for the active field. The properties will vary depending on the active field.

To create a new field, enter a Field Name in the **Field Name** column. Field Names consists of up to 64 characters (letters or numbers) including spaces.

Data Types

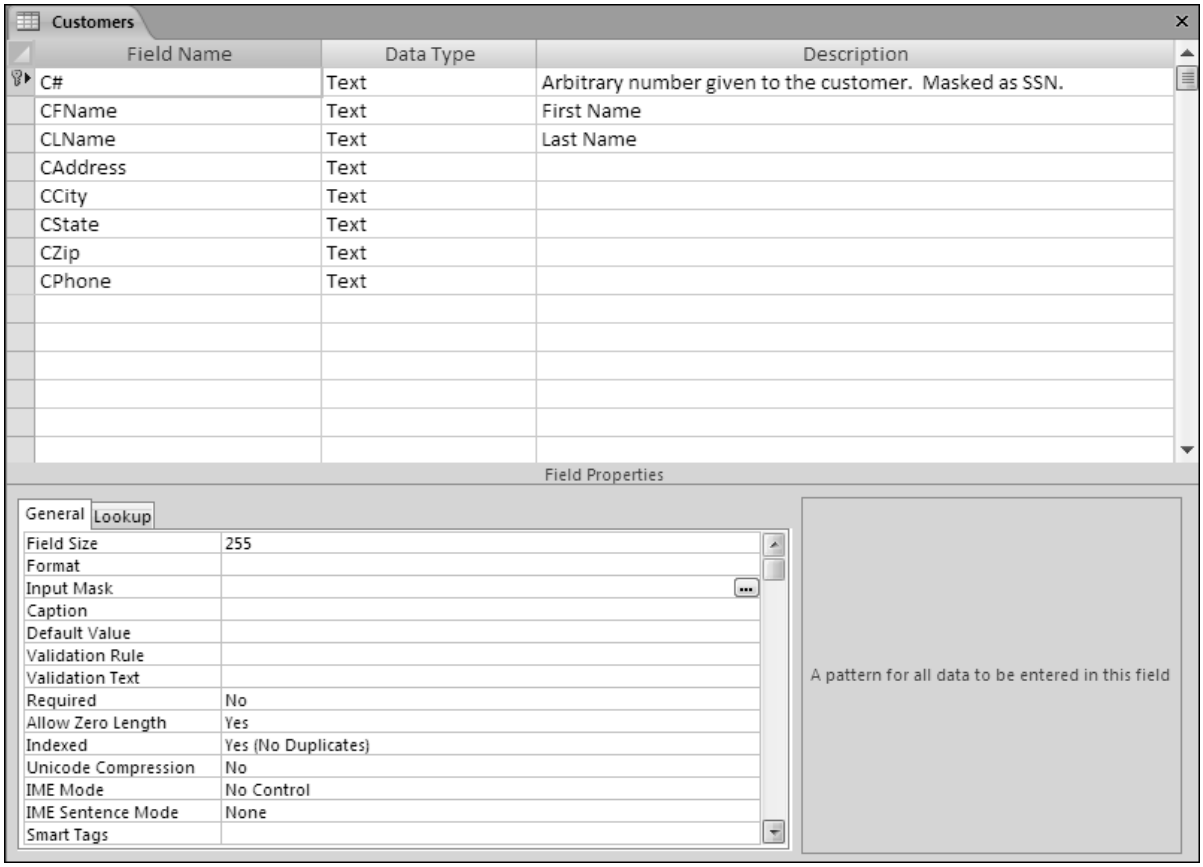
Data Types determine how data is stored. They also define the allowable values for each field in the table.

Data Type	Description	Size
Text	Alphanumeric data: numbers, letters, symbols and special characters.	Up to 255 characters
Memo	Alphanumeric characters. Supports rich-text formatting (bold, italic, bulleted lists).	Store up to 2 GB. Display 65,535 characters
Number	Positive or negative values that can be used in arithmetic calculations.	Up to 16 bytes of data
Date/Time	Date and time information	8 bytes
Currency	Monetary values. No rounding during calculations.	8 bytes
AutoNumber	Automatically generated by Access when a new record is added.	Up to 16 bytes
Yes/No	Boolean (true/false) data. 1=Yes, 0=No.	1 bit
OLE Object	Used to embed or link objects created in other Office applications.	Up to 1 GB
Hyperlink	For storing web/email addresses. Allows single-click access. Also link to objects in another database.	1 GB
Attachment	Store digital images or file attachments to a record.	2 GB compressed
Lookup Wizard	Allows creation of multivalued fields. Displays in a drop-down list.	Up to 255 characters per value

EXERCISE – DEFINING FIELDS FOR CUSTOMERS

1. Close *Table1*.

2. Name and define the fields for the *Customers* table as follows:

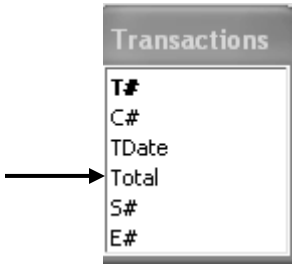


3. The description column is optional. You need only to make an entry in this area if the field is not obvious.

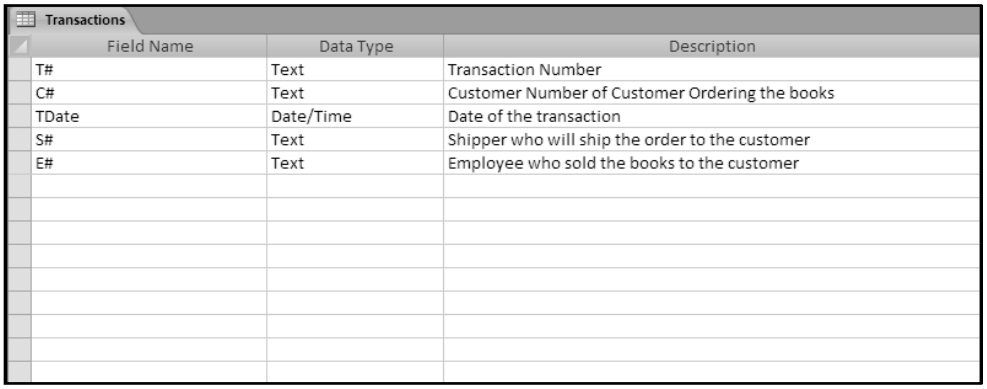
4. Save *Customers* table. Close *Customers* table.

EXERCISE – CREATE & DEFINE FIELDS FOR TRANSACTIONS

1. Create the *Transactions* table in Design View. On the *Create* tab of the ribbon in the *Tables* group, click the *Table Design* button. Refer to the *Transactions* table design on page 41 for the required fields:



2. Our design for the *Transactions* table shows a field called ***Total***. As discussed earlier calculated fields are usually not **stored** in the database. Access 2007 will calculate the total and present it in either form or report format when needed. Therefore, we will not create a field for *Total* in the *Transactions* table.



3. Save the table. Name it *Transactions*. Click OK**.**

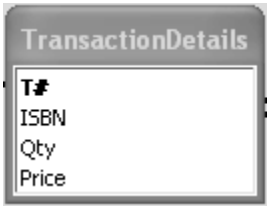
4. Access alerts you to define a primary key. Click No.

Microsoft Office Access
There is no primary key defined.
Although a primary key isn't required, it's highly recommended. A table must have a primary key for you to define a relationship between this table and other tables in the database.
Do you want to create a primary key now?
Yes
No
Cancel

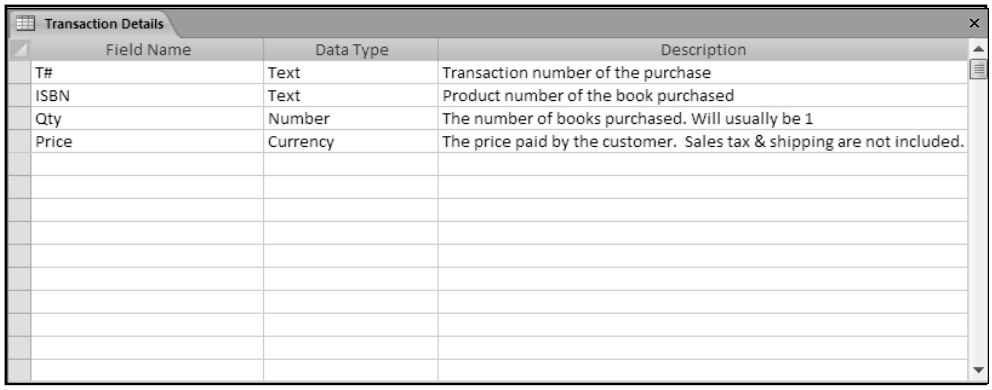
5. Close the *Transactions* table.

EXERCISE – CREATE & DEFINE TRANSACTION DETAILS

1. Create the *Transaction Details* table in Design View. On the *Create* tab of the ribbon in the *Tables* group, click the *Table Design* button. Refer to the *Transaction Details* table design on page 41 for the required fields:



2. This table shows the details of what was actually purchased by the customer. It was created to reduce unnecessary data duplication. *(see discussion on page 40).*



3. Save the table. Name it *Transaction Details*. Click OK.
4. Access alerts you to define a primary key. Click No.
5. Close the *Transaction Details* table.

PRIMARY KEY

A Unique Identifier

A *Primary key* is a field (or fields) that provide Access 2007 with a unique identifier for each record. Each time the table is opened, it is automatically sorted by the primary key. When a new record is added to the table, Access checks to ensure that there is no other record with the same value in the primary key field. If the data is a duplicate, Access will display a message indicating that duplicate values exist and will not allow the record to be saved.

The primary key field can not be left blank when a new record is added to the table as it is the field that is checked and used for sorting. Access will not allow the record to be saved.

When you elect to create a new table by adding records in the Datasheet View, a new feature in Access 2007 automatically creates a field named ID that is defined as the primary key. The data type assigned to ID is the AutoNumber type, assigning a sequential number with each new record.

Primary Key Button

To create a Primary key field for a table, place your cursor anywhere in the field row and click the *Primary Key* button in the *Tools* group on the *Design* tab.

Access places a key icon to the left of the Field Name to designate that field as the Key field.

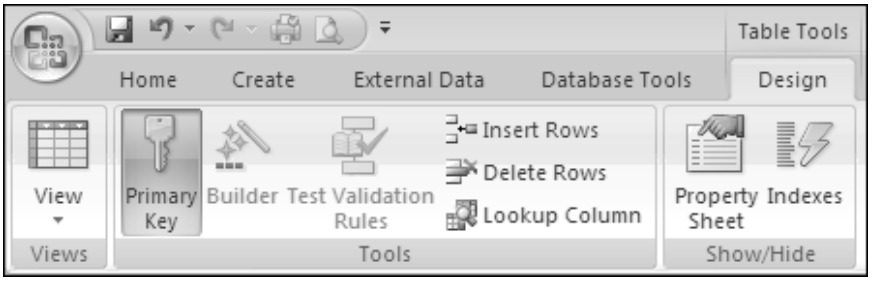
	Field Name
	dateregistered
🔑	employeeid
	firstname
	lastname
	college

Steps to Assign a Primary Key

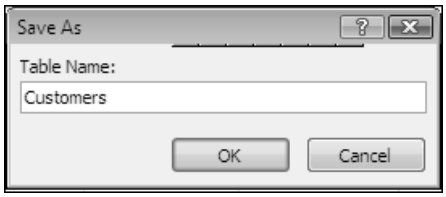
1. While in *Design View*, place your cursor anywhere in the field row that you have determined to be the Primary Key.
2. Click on the *Primary Key* button in the *Tools* group on the *Design* tab.
3. Click the Save button on the Quick Access bar.

EXERCISE – CREATING A PRIMARY KEY

1. Open the *Customers* table in *Design View*.
2. Place your cursor anywhere in the *C#* field row.
3. On the *Design* tab of the ribbon in the *Tools* group, click the *Primary Key* button.



4. Save the *Customers* table. *(If you are prompted for a Table name to save the table, type Customers.)* Click OK. Do not close the *Customers* table.



5. Follow the steps above to create a primary key for the *Transactions* table. *T#* is the primary key for the *Transactions* table.

We will not create a primary key for Transaction Details at this time.

FIELD PROPERTIES

Field Properties Pane

The lower half of the work area in Design View displays the available field properties depending on data type. The field property can be used to control the display of the data and for data validation. Special characters, such as dashes in a phone number, are not actually stored in the table. They are used for display purposes only to create a more readable format.

If a field property is changed after data has been entered into the table, a warning message is displayed as data could be lost if a field size or data type is modified. **Make a backup copy of the table data before making changes to the table structure**.

Several Field Properties:

Property	Description
Field Size	Maximum size for data. Defaults to 255 characters for text. Also used for number or Autonumber data types.
Format	Customize the way data is displayed. For example using (>) forces all characters to display in uppercase. Use when you need to display data in a consistent format.
Input Mask	Displays editing characters to guide data entry – dashes in phone number.
Caption	Will be used as the column heading in datasheet view and the label in a form.
Default Value	Automatically assigns the specified value to a field when a new record is added. Does not alter the value in existing fields. Saves data entry time.
Validation Rule	Establishes a rule to set boundaries for entering field values.
Validation Text	Displays a message that is displayed when the validation rule is breached.
Required	This field must contain a value in every record if set to 'Yes'. If set to 'No', field can be left blank.
Decimal Places	Can specify up to 14 decimal places for number or currency data types.
Indexed	Creates an index to speed up read access to data in this field.
Append Only	Allows edits to a Memo data type while retaining a history of the data in that field over time. Changing the property to 'No' will erase field value history.

EXERCISE – SETTING FIELD SIZE & FORMAT PROPERTIES

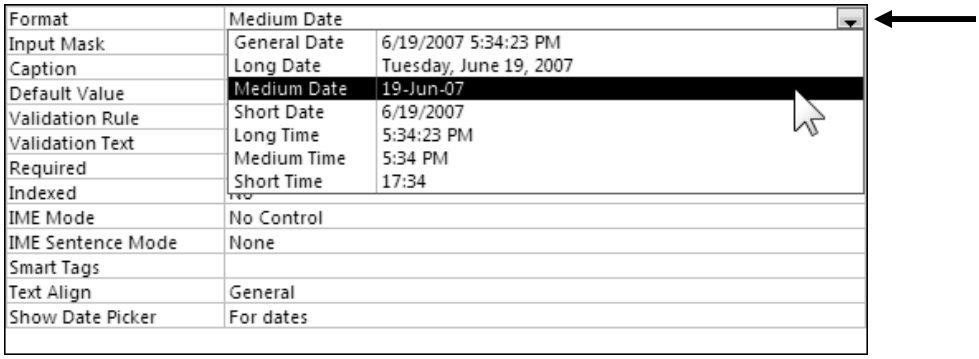
1. Open the *Customers* table in *Design* View. Place the cursor in the data type column of the *CState* field.

2. The field properties pane displays all allowable properties for this field. The field size property defaults to 255 characters for the **Text** data type. The *CState* field will take up only 2 characters. By changing the field size to 2, Access will not allow an entry greater than 2 characters thus, validating the data. Access will not however, validate **which** characters are allowable for the field. Change the field size to **2.**

3. Save the *Customers* table.

4. Open the *Transactions* table in *Design* View. Place the cursor in the data type column of the *TDate* field.

5. Click the **Format** property box. Click the pull-down on the far right of the box.



Access 2007 provides a set of predefined date and time formats.

6. Click the **Medium Date** format.

7. Save the *Transactions* table.

INPUT MASKS

Consistency of Data

An input mask establishes a pattern in the Datasheet view which indicates how data is to be entered into the field. Input masks ensure that data is entered consistently into the tables. In addition to specifying the position and amount of characters in a field, you can customize masks that restrict the data entered and whether or not the data is optional.

The Input Mask Wizard contains a list of predefined masks provided by Access 2007. You can also customize your own input mask using the Customize Input Mask Wizard.

Create Your Own

The *Edit List* button in the Input Mask Wizard allows you to change any of the existing patterns. For example, the pattern for telephone number (602) 255-5545 can be changed to 602-255-5545. You can also add new patterns.

Steps to Add Input Mask Properties

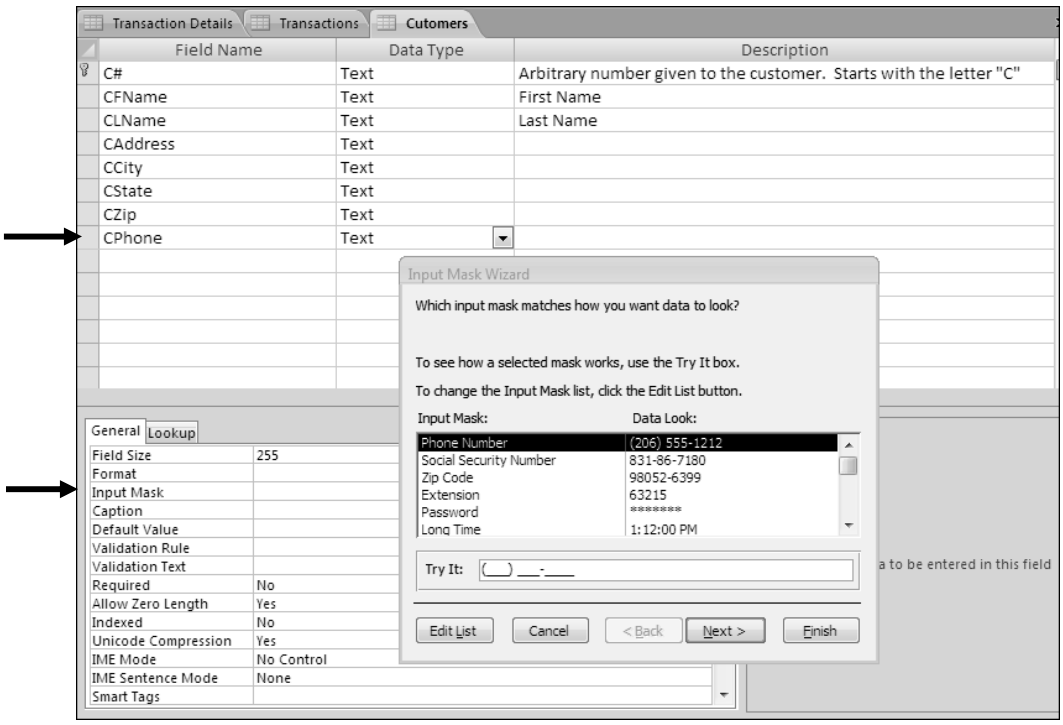
1. Open the table in Design view.
2. Place your cursor in the data type column of the field that requires the Input Mask.
3. In the Field Properties pane, click the Input Mask property field box. Click the *Build* button at the end of the box. The Input Mask Wizard opens.
4. Select one of the predefined Masks. Click the *Try It* field. Type in a value for the field to examine how the data is displayed.
5. To edit a Mask, select the Mask and click the Edit List button

. The Customize Input Mask Wizard window opens.
6. Edit the Input Mask field and click the **Close** button.
7. Click the **Finish** button. The Input Mask Wizard closes.
8. Save your design changes.

EXERCISE – INPUT MASK

1. Open the *Customers* table in Design view. The finance manager noticed that we did not include the customer's phone number in the table. Add CPhone to the end of the field list as shown below. Tab to include the data type.

2. Save the *Customers* table.



3. Place the cursor in the Input Mask field. Click on the *Build* button that appears at the end of the box. The Input Mask Wizard window opens.

4. Select Phone Number. Click the *Try It* field. Be sure to place the cursor at the beginning of the input box.

5. Type 6025559999. Note that the dashes are inserted for you. However, the dashes are not actually saved in the database.

6. Click the **Finish** button. The Input Mask Wizard window closes.

7. Save the *Customers* table.

DEFAULT VALUE

Auto Fill

The *Default Value* property is used to define a value that will automatically be entered for the field when you create a new record. The values in existing records are not affected.

Although the default value is automatically entered into a field, the value can be modified in datasheet view.

Expressions

An Expression is a formula that calculates a value. For example, expressions can be created to auto fill the current date or to leave a field blank.

Today's Date Default

A common default value expression is *today's* date in the date field. In order to have the current date auto fill into a date field, type the following expression into the date field's Default Value property: **Date()**

Steps to Add Default Value Properties

1. Open the table in Design view.
2. Place your cursor in the data type column of the field that requires the Default Value.
3. In the Field Properties pane, click the Default Value property field box. Click the *Build* button at the end of the box. The Expression Builder opens.
4. Create your expression using functions, constants, or operators. When finished, click OK.
5. Create a default value directly by clicking the Default Value field and entering a value or expression.
6. Save your design changes.

EXERCISE – ADD A DEFAULT VALUE

1. The *Customers* table is open in Design view. If it is not, open it now. **Books4U** customers reside in the state of Arizona. To ease entry of data into this field, a default value will be defined.

2. Place the cursor in the data type column of the *CState* field.

3. Click the *Default Value* box in the *Field Properties* pane. Type "AZ". Save the table.
   (Type the data in uppercase if that is how you will be using it)

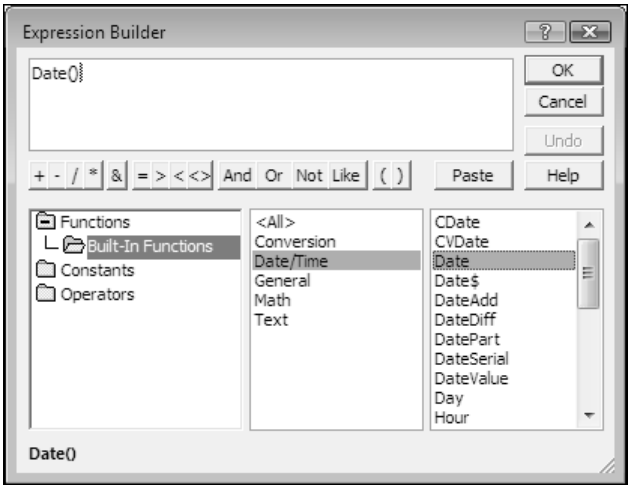
   Books4U also would like to ease the data entry for transactions. The date of the transaction will always be today's date. Rather than typing the date manually for each transaction, setting the default value to *Today's date* will automatically generate that value in the *TDate* field.

4. Open the Transactions table in Design view.

5. Place the cursor in the data type column of the *TDate* field.

6. Use the *Expression Builder* to set the default. Click the *Default Value* box in the *Field Properties* pane. Click on the *Build* button that appears at the end of the box. The *Expression Builder* window opens.

   If you do not know the expression to set today's date default, use the buttons and columns to help. Date is a function, so start by double-clicking *Functions* and then *Built-In Functions*. The second column will display the Type options.

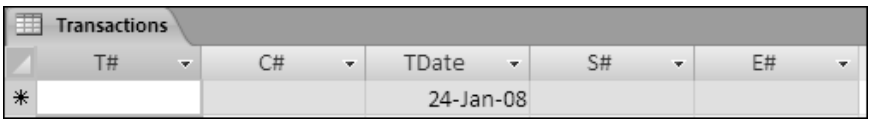


7. Select *Date/Time* as the type. The set of expressions available are displayed in the third column. Double-click the *Date* expression. The expression **Date()** is displayed in the *Expression Builder* window. Click OK.

8. The expression now appears in the Default Value of the field properties.

9. Save the *Transactions* table.

10. Toggle to *Datasheet* view to see the automatic entry for the *TDate* field.



VALIDATION RULE

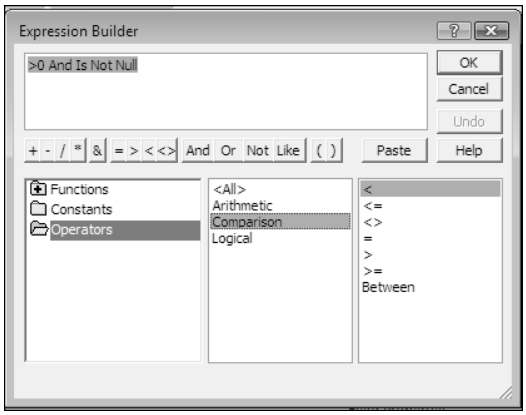
Conditional Test

The *Validation Rule* property is used to enter a conditional test that automatically checks for allowable values for that field. If the data entered fails to satisfy the condition, Access 2007 refuses to accept the data and displays a predefined error message. To customize the error message that is displayed when the validation rule is violated, type a validation message in the *Validation Text* property box.

Validation Text

Expression Builder

The Expression Builder helps to build your formula with buttons for common operators. *Comparison* and *Logical* operators are also available. When you double-click on the operators in the third column, Access moves them up to the Expression Builder window and starts to build your formula. You add specific information. For example, if your date must fall after 2007, create a formula requiring the date to be greater than 12/31/2007.



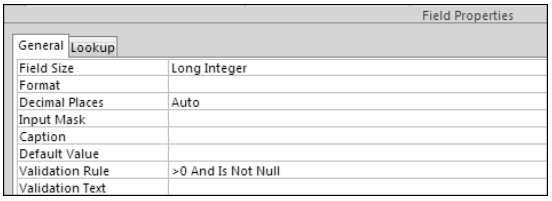
Common Arithmetic Operators

Operator	Function	Example
NOT	Tests for contrary values. Use before any comparison operator.	NOT = 5
IN	Tests data for values that equal any member of a comma-separated list. List must be in parentheses.	IN (“Phoenix”, “Tempe”)
BETWEEN	Range of values. State upper and lower bounds separated with an AND.	BETWEEN 1 AND 10
LIKE	Matches patterns in Text and Memo data types. Use wild card characters for a *similar* match.	LIKE “Rio*”
IS NOT NULL	Field must not be blank.	IS NOT NULL
AND	Both conditions must exist for data to be accepted.	>=1 AND <=10
OR	At least one of the conditions must exist.	“Red” OR “Blue”

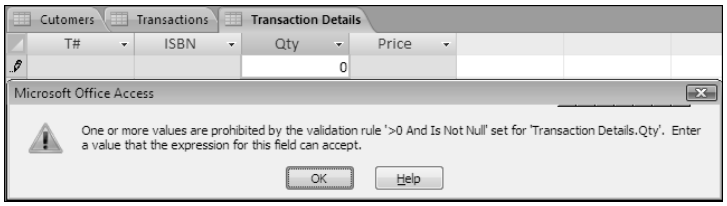
EXERCISE – VALIDATION RULE/VALIDATION TEXT

The ***Books4U*** database must ensure that if a book appears in a transaction, the quantity must be greater than zero (at least one book is purchased). This field cannot be left blank.

1. Open the *Transaction Details* table in *Design* View.
2. Place your cursor in the Data Type column of the *Qty* field.
3. In the Field Properties pane, click the *Validation Rule* box (we will not use the Expression Builder for this example). Type: **>0 and Is Not Null**.

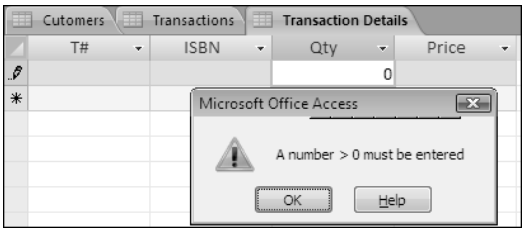


4. Save the *Transaction Details* table. Toggle to *Datasheet* view.
5. To test the rule, type **0** in the *Qty* field and press *Enter*. Access 2007 checks the data entered against the data validation rules for this field. Because the data entered violates the rule of quantity being greater than zero, a predefined message is displayed and Access does not accept the entry. Click **OK** to correct the entry.



   To display a message that is easier to understand for the user, customize the message in the *Validation Text* box of the Field Properties pane.

6. Enter the number **1** in the *Qty* field, and toggle back to *Design* view.
7. In the *Validation Text* box of the Field Properties pane, type; **A number > 0 must be entered**. Save the table. Toggle back to *Datasheet* view to test.
8. Enter a **0** in the *Qty* field and press *Enter*. A more comprehensible message for the user is displayed after Access performs the validation test.
9. Click OK. Type a number > 0 in the *Qty* field.
10. Save the *Transaction Details* table.



LOOKUP FIELD

Drop-down List

Another way to validate data is to restrict the exact values that can be entered. A **drop-down list** is created for the field and displayed in *Datasheet* view. Allowing the user to choose from a list will also limit and reduce typing errors for data that must be entered repeatedly.

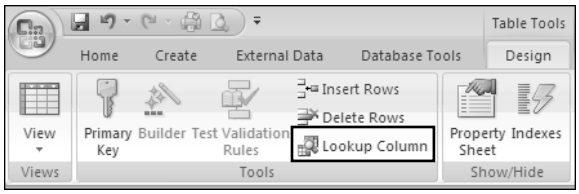
Limit To List

You can further restrict the field to only those items in the drop-down list. Setting the *Limit To List* property to "Yes" will cause Access 2007 to display an error message and reject the data if any value not in the list is entered.

Lookup Wizard

The Lookup Wizard is used to create the drop-down list. Values for the list can be picked from data in a table or query, or you can enter the values yourself.

To launch the Lookup Wizard, click the data type column of the field in *Design* view. Use the data type pull-down menu to choose the Lookup wizard. Another way to launch the Lookup wizard is to click the *Lookup Column* button in the *Tools* group of the *Design* tab in Design view.



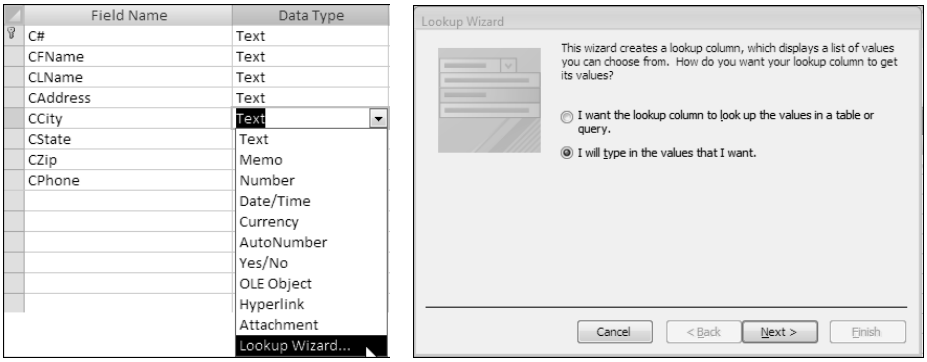
Note: Upon returning to Design view from the Lookup Wizard, you will notice that the data type for the Lookup field is Text.

Steps to Create a Lookup Field

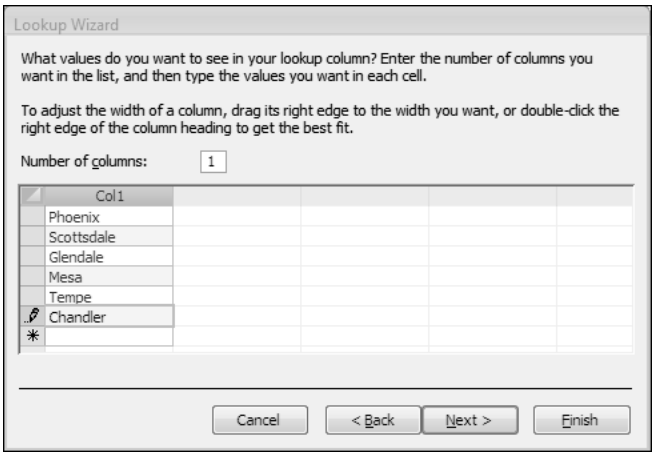
1. Open the table in *Design* View.
2. Click the Data Type column of the field to be created. Click the drop-down menu and select Lookup Wizard.
   The Lookup Wizard window launches.
3. Specify that the lookup column will accept the values from a table or query and click **Next**. Access will prompt you for table and field names. Click **Finish.**
   OR
   Specify that you will type in the values and click **Next**
   Enter the values in the column provided and click **Next**.
   Change the column name, if desired. Click **Finish.**

EXERCISE – CREATING A LOOKUP FIELD

1. Open the *Customers* table in *Design* View. Click the data type column for the *CCity* field. Click the drop-down menu and select *Lookup Wizard*. The Lookup Wizard will launch.



2. Click the radio button ***I will type in the values that I want***. Click **Next**.


Lookup Wizard
What values do you want to see in your lookup column? Enter the number of columns you want in the list, and then type the values you want in each cell.
To adjust the width of a column, drag its right edge to the width you want, or double-click the right edge of the column heading to get the best fit.
Number of columns:
1
Col1
Phoenix
Scottsdale
Glendale
Mesa
Tempe
Chandler
Cancel
< Back
Next >
Finish

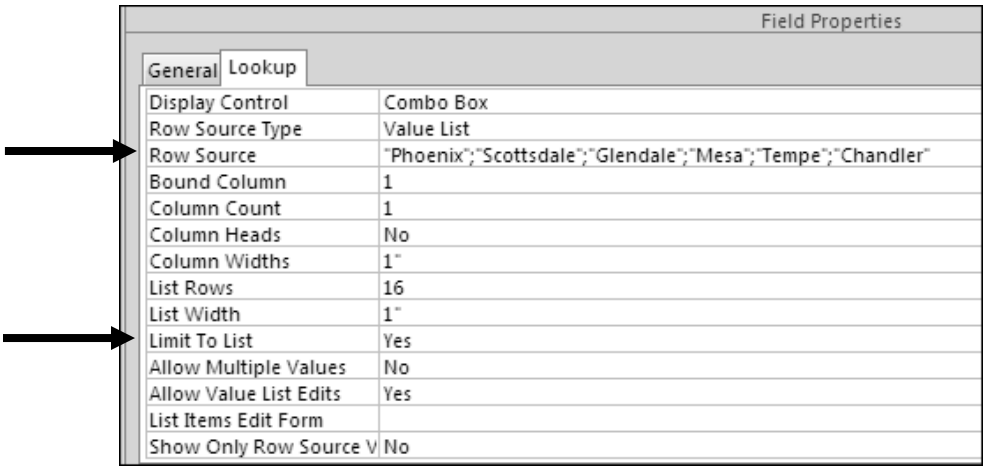
3. Type the six major cities of the Phoenix valley as shown. Use the ***Tab*** key to advance to the next entry. If you press *Enter* before all of your entries are typed, click the *Back* button. When you are finished with your entry, click **Next**.

4. You can make a change to the name of the lookup column. Click **Finish**. You are returned to *Design* view. The data type for your lookup field is displayed as Text.

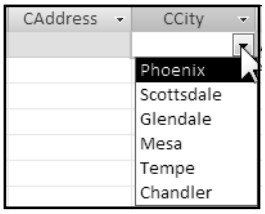
5. **Save** the table.

EXERCISE – CREATING A LOOKUP FIELD

6. Click the *Lookup* Tab for the *CCity* field in the Field Properties pane. The *Row Source* property lists the allowable values for this field.



7. To ensure that these are the only values that will be accepted for the *CCity* field, change the *Limit To List* property to "Yes".



8. Save the table. Toggle to Datasheet View.
9. Click the pull-down menu in the first row for *CCity*. The list of accepted values is displayed. Click on any cell to close the list.
10. Click the *CCity* field box. Type "**Gilbert**" and tab to the next cell.
11. Access 2007 checks the data entry with the list of allowable values. The following message is displayed when the value was rejected.

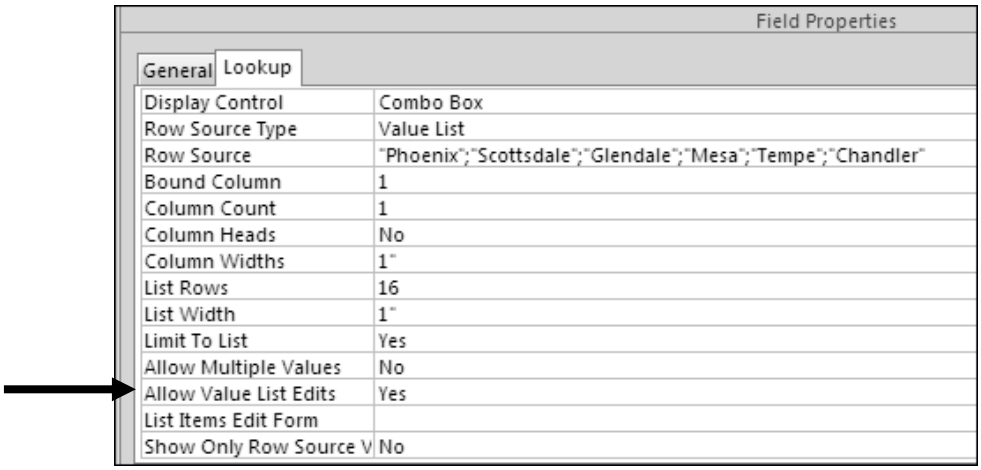
Microsoft Office Access
The text you entered isn't an item in the list.
Select an item from the list, or enter text that matches one of the listed items.
OK

12. Click **OK**.
13. Use the pull-down menu to choose a city on the list. Type number 9 in the C# field.
14. Save the *Customers* table.

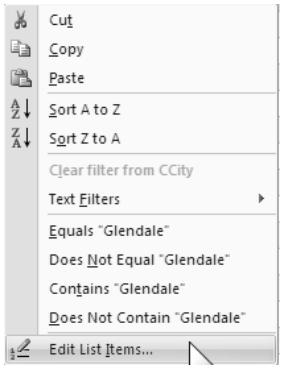
EXERCISE – CHANGE A LOOKUP FIELD

Gilbert is a new city that has just opened up for us. Modify the lookup field in *Datasheet* view to include this city.

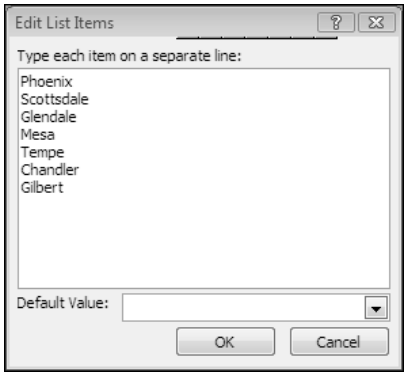
1. The *Customers* table is open.
2. Toggle to *Design* View. Click the *Lookup* Tab for the *CCity* field in the Field Properties pane.



3. Change the *Allow Value List Edits* property to **Yes**. **Save** the *Customers* table.
4. Toggle to *Datasheet* view.
5. Right-click any record in the *CCity* column and then click *Edit List Items* on the shortcut menu.



6. Add *Gilbert* to the bottom of the list and then click **OK**.



IMPORT DATA FROM AN EXTERNAL SOURCE

Back to Datasheet View

Now that the table structures have been defined and data types assigned in *Design* view, toggle to *Datasheet* view to enter the data. Entering data in Access is similar to entering data in an Excel spreadsheet. However, start in the top left column and enter data **by rows**, not by columns. Use the *Tab* key to advance the cursor to the right. Access will *Save* the data to the table when you press the *Enter* key at the end of the row.

Populate Tables by Importing Data

Our ***Books4U*** database contains several tables. This workshop is not an exercise in typing data into a table. We will therefore populate our tables by importing data from multiple external sources. This is common if you are switching from Excel to Access, upgrading from a previous version of Access to Access 2007, or simply copying and pasting a portion of another table within your database.

What can be Imported?

When you import data, a copy of that data is placed in a new or existing table without altering the source file. Data can be imported from several sources; Excel spreadsheets, a table in another Access database, SharePoint lists, text files, HTML documents and other sources.

Options

When importing data from sources such as Excel, you can specify various data storage options; importing the data into a new table, appending a copy of the records into a specified table, or linking to the data source using a linked table (*See Appendix C to link data).* The *Get External Data* dialog box is used to specify the source and destination of the data to be imported. The import steps can also be saved for future access.

Steps to Import data from an External Source

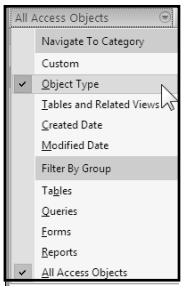
1. On the *External Data* tab, in the *Import group,* select the file format of the source file. The *Get External Data* dialog box will open.
2. Specify the location of the source data.
3. Select the option for importing, appending, or linking to the source file. Click OK.
4. The Wizard will guide you to complete the import procedure.

EXERCISE – IMPORTING FROM AN EXCEL SPREADSHEET

In this exercise, we will import data from several Excel spreadsheets into our ***Books4U*** database using the *Append* option. You can import data from *one worksheet at a time*.

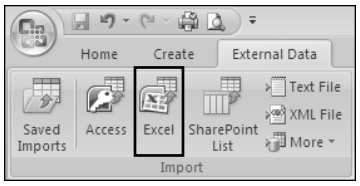
Most failures during append operations occur because the source data does not match the structure and field settings of the destination table. Before importing data from a spreadsheet, check to make sure that the column headers in Excel match (***exactly***) the field names in the database. Also check the cell formats of the spreadsheet data to ensure that they match with the data type definitions in the table.

1. Close all tables.

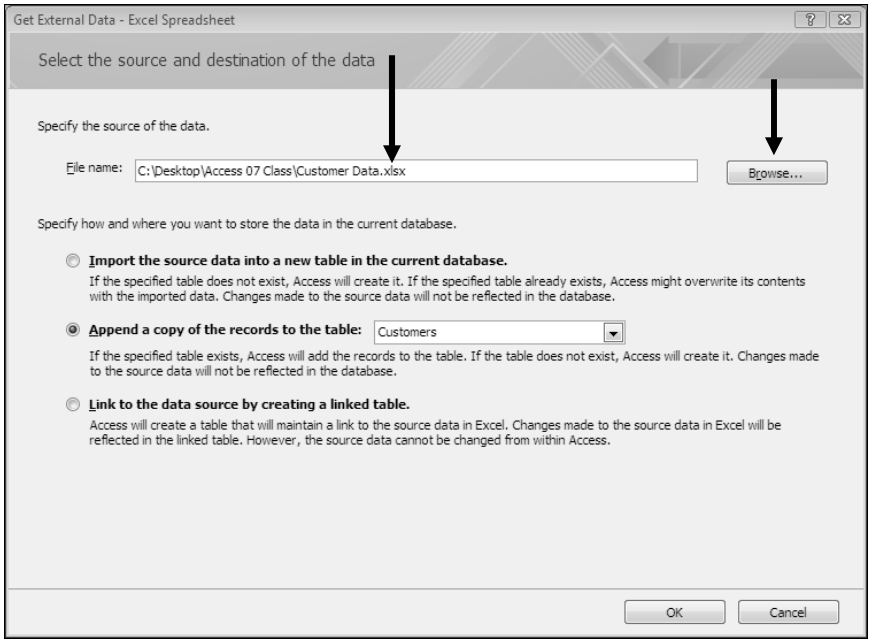


2. Check that you have three tables; *Customers*, *Transactions*, and *Transaction Details*. If you do not see them, click the pull-down menu on the Navigation pane and select *Object Type*.

3. On the *External Data* tab on the ribbon in the *Import* group, click the *Excel* button. The *Get External Data – Excel Spreadsheet* wizard opens.



4. In the File Name box, specify the Excel file that contains the data. Use the Browse button to locate the ***Customer Data*** file in the ***Access 07 Class*** folder on your ***Desktop***.

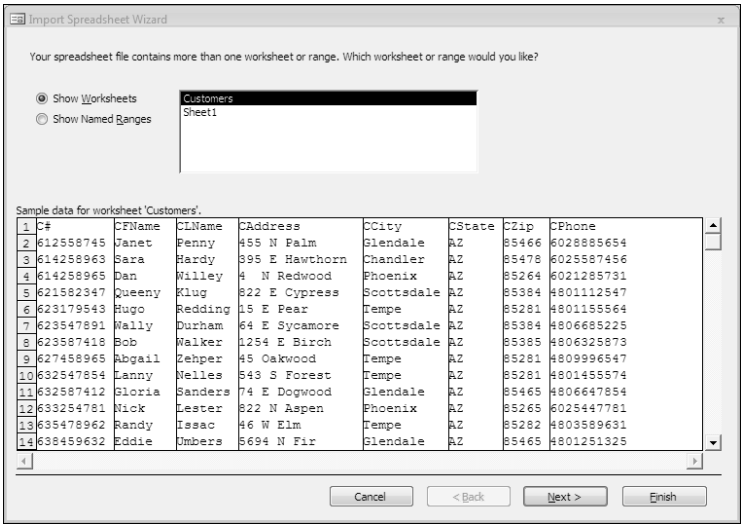

Get External Data - Excel Spreadsheet
Select the source and destination of the data
Specify the source of the data.
File name:
C:\Desktop\Access 07 Class\Customer Data.xlsx
Browse...
Specify how and where you want to store the data in the current database.
Import the source data into a new table in the current database.
If the specified table does not exist, Access will create it. If the specified table already exists, Access might overwrite its contents with the imported data. Changes made to the source data will not be reflected in the database.
Append a copy of the records to the table:
Customers
If the specified table exists, Access will add the records to the table. If the table does not exist, Access will create it. Changes made to the source data will not be reflected in the database.
Link to the data source by creating a linked table.
Access will create a table that will maintain a link to the source data in Excel. Changes made to the source data in Excel will be reflected in the linked table. However, the source data cannot be changed from within Access.
OK
Cancel

EXERCISE – IMPORTING FROM AN EXCEL SPREADSHEET

5. To specify the data destination, click the radio button to ***Append*** a copy of the records to the table. Use the pull-down box and select ***Customers***. Click OK.

   Note: Using append in this case will allow us to use the table structure that we've created for the *Customers* table. By choosing Import here, Access would create a new table and populate it with the data. However, there would be no structure defined and no formatting specified. Formatting fields after the data has been entered may become problematic.

6. The *Import Spreadsheet* Wizard opens. Click the *Show Worksheets* radio button and choose the worksheet that holds the desired data. Select the *Customers* worksheet. Click **Next**.



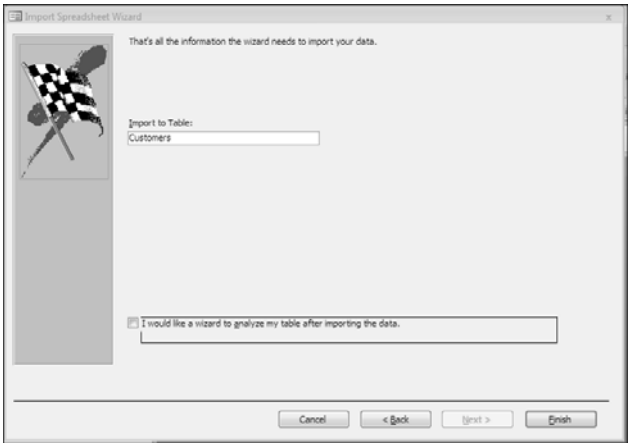
	C#	CFName	CLName	CAddress	CCity	CState	CZip	CPhone
2	612558745	Janet	Penny	455 N Palm	Glendale	AZ	85466	6028885654
3	614258963	Sara	Hardy	395 E Hawthorn	Chandler	AZ	85478	6025587456
4	614258965	Dan	Willey	4 N Redwood	Phoenix	AZ	85264	6021285731
5	621582347	Queeny	Klug	822 E Cypress	Scottsdale	AZ	85384	4801112547
6	623179543	Hugo	Redding	15 E Pear	Tempe	AZ	85281	4801155564
7	623547891	Wally	Durham	64 E Sycamore	Scottsdale	AZ	85384	4806685225
8	623587418	Bob	Walker	1254 E Birch	Scottsdale	AZ	85385	4806325873
9	627458965	Abgail	Zehper	45 Oakwood	Tempe	AZ	85281	4809996547
10	632547854	Lanny	Nelles	543 S Forest	Tempe	AZ	85281	4801455574
11	632587412	Gloria	Sanders	74 E Dogwood	Glendale	AZ	85465	4806647854
12	633254781	Nick	Lester	822 N Aspen	Phoenix	AZ	85265	6025447781
13	635478962	Randy	Issac	46 W Elm	Tempe	AZ	85282	4803589631
14	638459632	Eddie	Umbers	5694 N Fir	Glendale	AZ	85465	4801251325

7. The next window states that Access will use the column headings found in the Excel worksheet as field names for the database table. This is a default action. Click **Next.**

8. Before Access imports the data, it gives you one last chance to change the table name. Leave the name as *Customers* and Click **Finish**.

9. Do not save the import steps. Click Close.

10. Open the *Customers* table in *Datasheet* view to examine the data. Toggle to *Design* view to check formatting. Delete test rows.


Import Spreadsheet Wizard
That's all the information the wizard needs to import your data.
Import to Table:
Customers
I would like a wizard to analyze my table after importing the data.
Cancel
< Back
Next >
Finish

EXERCISE – IMPORTING FROM AN EXCEL SPREADSHEET

Import data into the *Transactions* table next. The procedure is the same as defined on the previous pages. Do a quick check of Excel column headers and data formats to ensure that they match the definitions in the database tables.

11. Close all tables.
12. On the *External Data* tab on the ribbon in the *Import* group, click the *Excel* button. The *Get External Data – Excel Spreadsheet* wizard opens**.**
13. In the File Name box, specify the Excel file that contains the data. Use the Browse button to locate the ***Transactions Data*** file in the ***Access 07 Class*** folder on your ***Desktop.***
14. To specify the data destination, click the radio button to ***Append*** a copy of the records to the table. Use the pull-down box and select ***Transactions***. Click OK.
15. The *Import Spreadsheet* Wizard opens. Click the *Show Worksheets* radio button and choose the worksheet that holds the desired data. Select the *Transactions* worksheet. Click **Next**.
16. The next window states that Access will use the column headings found in the Excel worksheet as field names for the database table. This is a default action. Click **Next**.
17. Before Access imports the data, it gives you one last chance to change the table name. Leave the name as *Transactions* and Click **Finish.**
18. Do not save the import steps. Click **Close**.
19. Open the *Transactions* table in *Datasheet* view to examine the data. Toggle to *Design* view to check formatting.

20. Finally, import data into the *Transaction Details* using the same *Append* procedures as outlined above. Use the Browse button to locate the ***Transactions Data*** file in the ***Access 07 Class*** folder on your ***Desktop.***
21. The data destination is the *Transaction Details* table.
22. The Excel worksheet that contains the data is the *Transaction Details* worksheet.
23. Check the data in both *Datasheet* and *Design* view of the *Transaction Details* table.

EXERCISE – IMPORTING FROM AN EXCEL SPREADSHEET

The *Books* table is the next table we will import. Data for this table is also stored in an Excel spreadsheet. However, the import procedures will vary slightly as we do not currently have a table defined for this data. Access will create a new table to store the data. Formatting will be done after the data has been entered.

24. Close all tables.

25. On the *External Data* tab on the ribbon in the *Import* group, click the *Excel* button. The *Get External Data – Excel Spreadsheet* wizard opens**.**

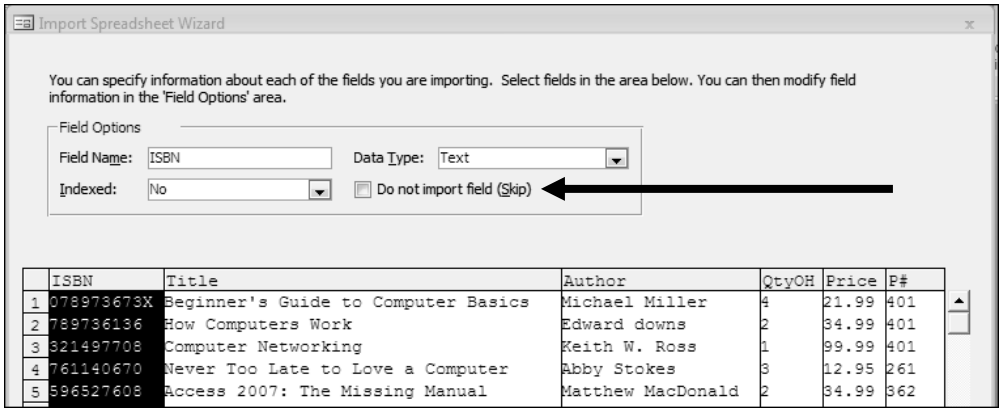
26. In the File Name box, specify the Excel file that contains the data. Use the Browse button to locate the ***Book Data*** file in the ***Access 07 Class*** folder on your ***Desktop.***

27. To specify the data destination, click the radio button to ***Import the source data into a new table in the current database.*** Because we currently do not have a table created to accept this data, Access will create the table. Click **OK**.

28. The *Import Spreadsheet* Wizard opens. Click the Show Worksheets radio button and choose the worksheet that holds the desired data. Select the ***Books*** worksheet. Click **Next.**

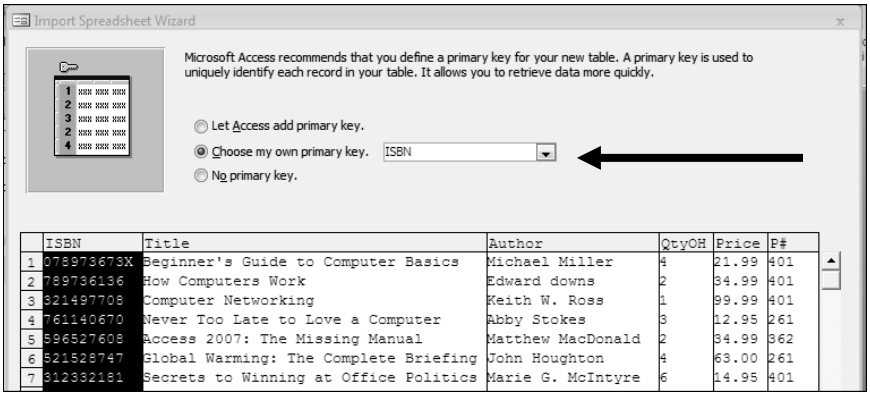
29. Make sure that you manually check the *First Row Contains Column Headings* box. When we appended data to an existing table, this action was automatically set for us. Click **Next**.

30. This window allows you to specify which fields you will be importing and permits a change to the field name. Click on each field to select it. Use the slider bar at the bottom of the window to view all fields. If you do not wish to import a particular field, check the *Do not import field* box. We will be importing all fields and retain the existing field names. Click **Next**.


Import Spreadsheet Wizard
You can specify information about each of the fields you are importing. Select fields in the area below. You can then modify field information in the 'Field Options' area.
Field Options
Field Name: ISBN
Data Type: Text
Indexed: No
Do not import field (Skip)
ISBN Title Author QtyOH Price P#
1 078973673X Beginner's Guide to Computer Basics Michael Miller 4 21.99 401
2 789736136 How Computers Work Edward downs 2 34.99 401
3 321497708 Computer Networking Keith W. Ross 1 99.99 401
4 761140670 Never Too Late to Love a Computer Abby Stokes 3 12.95 261
5 596527608 Access 2007: The Missing Manual Matthew MacDonald 2 34.99 362

EXERCISE – IMPORTING FROM AN EXCEL SPREADSHEET

31. In this window, we define a primary key for our table. From past discussions, it is necessary to set a primary key to ensure that all records in the table are unique. It is never a good idea to allow Access to add the primary key – keep control of your data at all times. For the *Book* data, the *ISBN* number is a unique key that has already been provided through standard coding. Click the middle radio button to choose the primary key. Use the pull-down menu to select the *ISBN* number. Click **Next**.


Import Spreadsheet Wizard
Microsoft Access recommends that you define a primary key for your new table. A primary key is used to uniquely identify each record in your table. It allows you to retrieve data more quickly.
Let Access add primary key.
Choose my own primary key.
ISBN
No primary key.

	ISBN	Title	Author	QtyOH	Price	P#
1	078973673X	Beginner's Guide to Computer Basics	Michael Miller	4	21.99	401
2	789736136	How Computers Work	Edward downs	2	34.99	401
3	321497708	Computer Networking	Keith W. Ross	1	99.99	401
4	761140670	Never Too Late to Love a Computer	Abby Stokes	3	12.95	261
5	596527608	Access 2007: The Missing Manual	Matthew MacDonald	2	34.99	362
6	52152874	Global Warming: The Complete Briefing	John Houghton	4	63.00	261
7	812332181	Secrets to Winning at Office Politics	Marie G. McIntyre	6	14.95	401

32. The final window allows us to name our new table. Type *Books*. Click **Finish**.

33. Do not save the import steps. Click **Close**.

34. Open the *Books* table. While in *Datasheet* view, resize the columns to display all data. Notice that all columns except *QtyOH* and *Price* are in text format. Check that *QtyOH* is in **number** format and *Price* is in **currency** format; toggle to *Design* view by clicking on the *Home* Tab, *View* button.

35. *P#* is the Publisher number of the book. Notice that *P#* is repeated several times in the *Books* table. To have access to the rest of the Publisher information, we will import the data.

36. Follow the same procedure above to import the Publisher data. Use the Browse button to locate the ***Book Data*** file in the ***Access 07 Class*** folder on your ***Desktop.*** Select the ***Publishers*** worksheet.

37. Set *P#* as the primary key and name the new table *Publishers*.

38. Open the *Publishers* table. Check that the data type formats are both **text** format.

IMPORTING DATA FROM AN ACCESS DATABASE

With or Without Data

Importing a table from another Access database offers the option of importing with or without data (definition only). If you import the definition of a table, the table is created as in *Design* View. Field names and data types are easily modified. Importing table relationships is also optional. There may be restrictions to the modifications on tables with data and/or established relationships included.

Appending Records

If your goal is to add records from another database to an existing table, consider importing the records to a new table and then creating an append query. (*We will discuss queries later in the manua*l) You cannot append records to an existing table from another database during an import operation. Access will not overwrite the existing table. If the same table name is used in an import operation, Access will created another version of the table (for example importing an Employees table to an already existing Employees table will result in Employees1).

Previous Versions

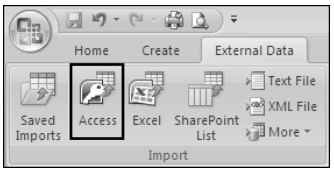
If the source database is an **.mdb** or **.accdb** file, you can import tables, queries, forms, reports, macros, and modules. Only tables can be imported from **.mde** or **.accde** files.

Tips When Importing Objects from Another Access Database

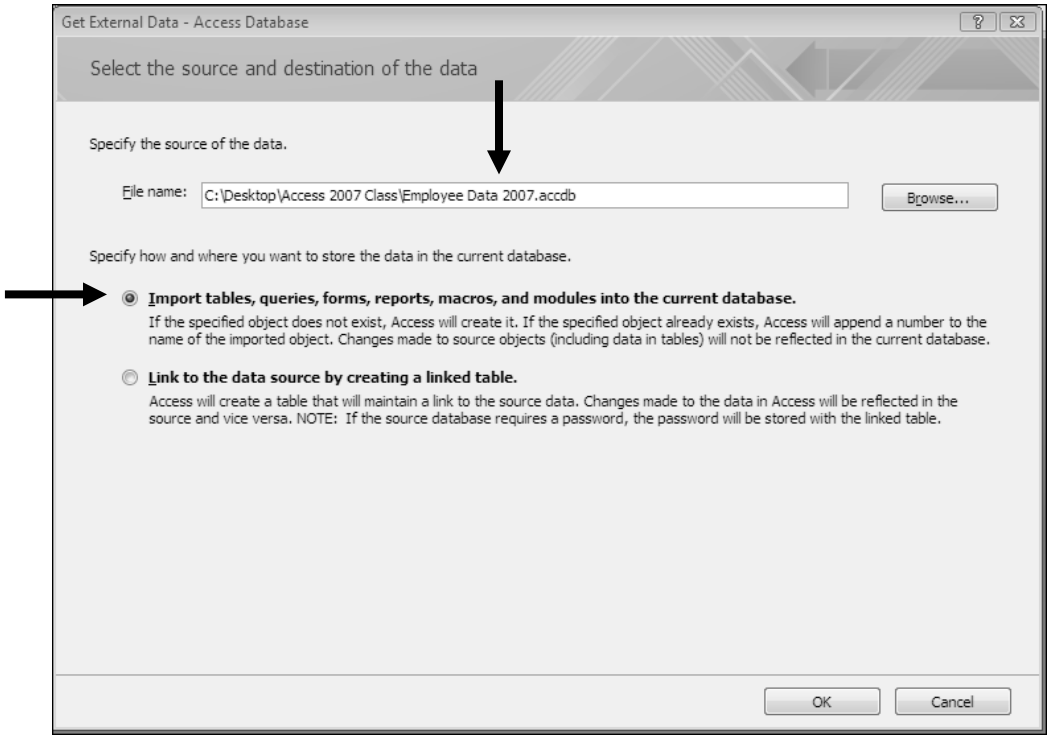
Object	Procedure
Multiple Objects	You can import multiple objects in a single import operation.
New Objects	Each import operation creates a new object in the destination database. You cannot overwrite an existing object or append records to an existing table by using an import operation.
Skipping fields & records	You cannot skip specific records or fields when importing data from a table or query. You can import the table definition without any data.
Relationships	Relationships between source tables can be imported.
Table Definition	Table definitions without the data can be imported. (*Table structure*)
Record Source objects	When importing a query, form or report, you must also manually import the source tables used to create these objects.
Lookup Fields	Lookup items defined in the field properties window will automatically be imported with the table. If the lookup items were created from a related table, that table must also be imported.
Subforms/Subreports	Subforms and subreports are not automatically imported. Each object and their underlying sources must all be imported.
Queries	A query can be imported as either a table or a query. Underlying tables must also be imported for queries as queries.

EXERCISE – IMPORTING FROM AN ACCESS DATABASE

In this exercise, we will import a table from an Access 2007 database (.accdb) and a table from an Access 2003 database (.mdb).



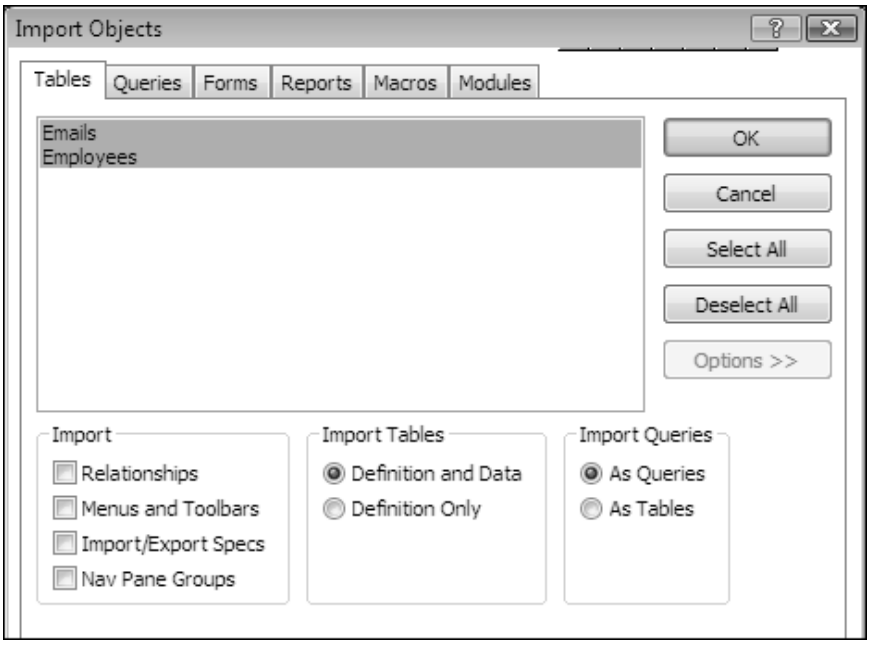
1. Close all tables.
2. On the *External Data* tab on the ribbon in the *Import* group, click the *Access* button. The *Get External Data – Access Database* wizard opens**.**
3. In the File Name box, specify the Access file that contains the data. Use the Browse button to locate the ***Employee Data 2007*** file in the ***Access 07 Class*** folder on your ***Desktop.***
4. To specify the data destination, click the radio button to ***Import tables, queries, forms, reports, macros, and modules into the current database.*** Because we currently do not have a table created to accept this data, Access will create the table. Click **OK**.


Get External Data - Access Database
Select the source and destination of the data
Specify the source of the data.
File name:
C:\Desktop\Access 2007 Class\Employee Data 2007.accdb
Browse...
Specify how and where you want to store the data in the current database.
Import tables, queries, forms, reports, macros, and modules into the current database.
If the specified object does not exist, Access will create it. If the specified object already exists, Access will append a number to the name of the imported object. Changes made to source objects (including data in tables) will not be reflected in the current database.
Link to the data source by creating a linked table.
Access will create a table that will maintain a link to the source data. Changes made to the data in Access will be reflected in the source and vice versa. NOTE: If the source database requires a password, the password will be stored with the linked table.
OK
Cancel

EXERCISE – IMPORTING FROM AN ACCESS DATABASE

5. The *Import Objects* Wizard opens. Across the top are the objects tabs. We can import all objects in the same import operation by clicking each tab and selecting the desired object. Click the **Tables** tab. In the window below the object tabs, click the ***Employees*** and **Emails** tables to select them. On the right hand side of the wizard, click the **Options>>** button to view specifics of the import operation. Because we are importing only the *Employees* table, all boxes in the *Import* group are unchecked.

6. We want to import both the data and the data definition of the *Employees* and *Emails* tables. In the *Import Tables* group, choose **Definition and Data**. Click **OK**.



7. Do not save the import steps. Click **Close**.

8. Open the *Employees* table in *Datasheet* view to examine the data.

9. To toggle to *Design* view to check formatting click the *Home* tab and then the *View* button on the ribbon.

10. Note that the *Title* field is a *Look Up* field. *E#* is set as the primary key field.

11. Open the *Emails* table to examine the data in both *Datasheet* and *Design* views.

12. Close the *Employees* and *Emails* tables.

EXERCISE – IMPORTING FROM AN ACCESS DATABASE

To import a table from a previous version of Access, follow the procedure on the preceding pages. The *Shippers* table can be found in an Access 2003 database.

13. On the *External Data* tab on the ribbon in the *Import* group, click the *Access* button. The *Get External Data – Access Database* wizard opens.

14. In the File Name box, specify the Access file that contains the data. Use the Browse button to locate the ***Shippers Data 2003*** file in the ***Access 07 Class*** folder on your ***Desktop.***

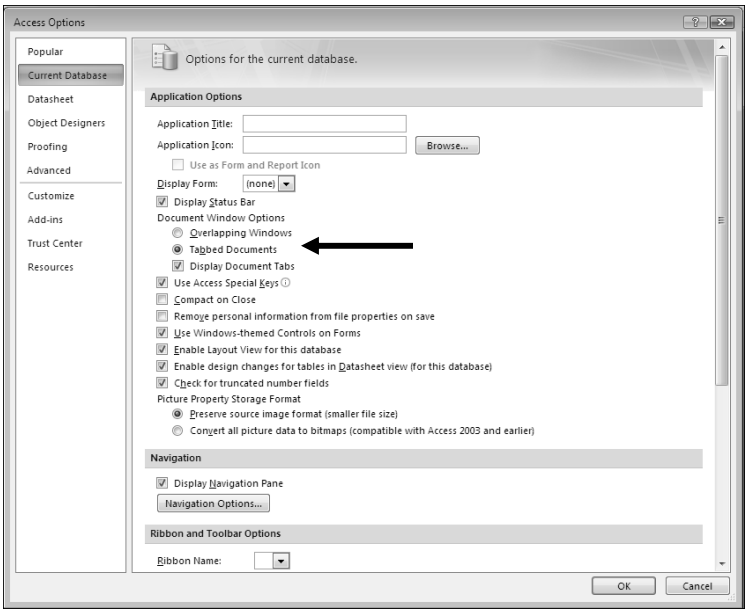
15. To specify the data destination, click the radio button to ***Import tables, queries, forms, reports, macros, and modules into the current database.*** Because we currently do not have a table created to accept this data, Access will create the table. Click **OK**.

16. When the Import Objects Wizard opens, click the **Tables** tab. In the window below the object tabs, click the ***Shippers*** table to select it. On the right hand side of the wizard, click the **Options>>** button. In the *Import Tables* group, choose **Definition and Data**. Click **OK**.

17. Do not save the import steps. Click **Close**.

18. Open the *Shippers* table in *Datasheet* view. Toggle to *Design* View.

19. You may notice that when converting an Access 2000-2003 database to an Access 2007 database, your tabs may not show. In previous versions of Access, each table was open in separate overlapping windows. To activate the tab feature for displaying tables, click the *Office* button.



20. Click the *Access Options* button at the bottom of the window. When the Access Options dialog box opens, click the *Current Database* button on the left side of the window. In the *Application Options* group under Document Window Options, click the *Tabbed Documents* radio button and check the *Display Document Tabs* box. Click **OK**.

21. Close the *Shippers* table.

CREATING RELATIONSHIPS

Related Data

Our ***Books4U*** database consists of several tables of related data. It is essential to separate the data into multiple tables to reduce unnecessary data redundancy and to decrease possible errors when adding to or modifying the database.

Linking Tables

The next step in the process is to establish table relationships that will ensure the accuracy of the data when generating reports or requesting information. Data may be retrieved from several tables to generate a single request. Linking the tables together to retrieve the required data creates the relationship. Related tables are linked through a common field. Depending on how the tables are related will determine the type of relationship required.

Note: The linking field may not be the only field that the two tables have in common. To avoid confusion, give the linking field the same name in both tables.

Referential Integrity

When creating relationships, one table is typically the ***primary*** table with the second being the ***related*** table. When the tables are joined based on a common field between the two, Access ensures the integrity of the data. For example, *Order* information (related table) for a C*ustomer* (primary table) will not be allowed into the database unless the customer exists. In other words, only customers in your database are allowed to have orders. Trying to find or *reference* a non-existing customer for an order would create an *orphan* order. Referential integrity is used to prevent orphans and keep references in sync so that the above situation never occurs.

Types of Relationships

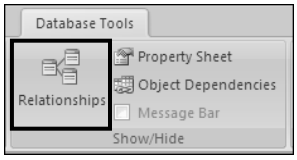
Relationship	Description
One-to-one	The common data appears only once in both tables.
One-to-many	The common data appears once in the primary table, but many times in the related table.
Many-to-many	The common data can appear many times in both tables. A third table must be created to reduce the redundancy of the data and to create two one-to-many relationships.

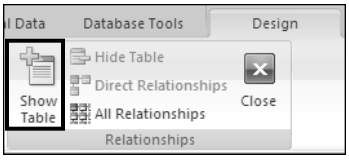
EXERCISE – CREATING ONE-TO-ONE RELATIONSHIPS

In a one-to-one relationship, for each record in the primary table, there will be one and only one record in the related table. The common data field will be the primary key in both tables. One-to-one relationships are rarely included in the database design. Depending on the amount of data, it may be more efficient to combine the tables. In our **Books4U** database, the employee's email address was overlooked during the design phase. We will combine the data later, but before we do that, we must establish a relationship between the two tables. The layout on your handout will guide you.

1. Close all tables.

2. On the *Database Tools* tab in the *Show/Hide* group, click the *Relationships* button.



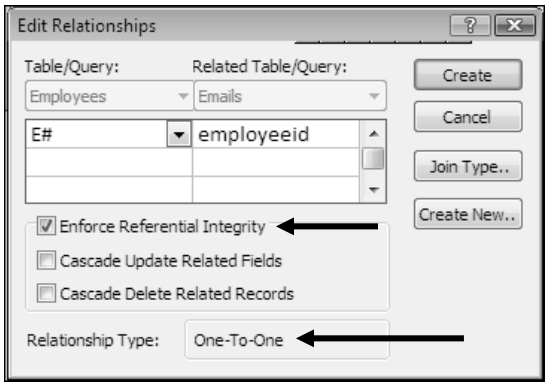


The *Design* tab is activated. In the *Relationships* group, click the *Show Table* button.

3. The Show Table window opens. On the *Tables* tab, select *Employees* <shift> *Emails* to select both tables and click the **Add** button. Click **Close**.

4. Both tables are displayed in the Relationship layout area. Click and drag the edges of the tables to expand them if necessary to view all field names.

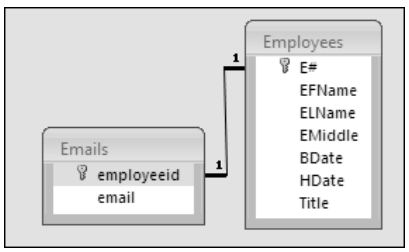
5. The common field in both tables is Employee Number. *Note that the field **name** does not have to match in both tables.* Position the mouse pointer over *E#* in the *Employees* table list box, hold down the left mouse button, drag the pointer to *Employeeid* in the *Emails* table list box, and release the mouse button. The *Edit Relationships* dialog box appears.



Note the One-to-One relationship type. Access determined the relationship type based on the common field that was used to join the tables. *E#* in the *Employees* table is related to *employeeid* in the *Emails* table.

6. Click the *Enforce Referential Integrity* box. Click **Create**. Save the relationship.

For each employee there is one and only one email address. Each email address belongs to one and only one employee.



EXERCISE – CREATING ONE-TO-MANY RELATIONSHIPS

In a one-to-many relationship, for each record in the first table (primary table), there will be one or more related records in the second table (related table). The common data field will be the *primary key* in the primary table, and a non-primary key field or *foreign key* in the related field. This relationship is found most often in Access databases.

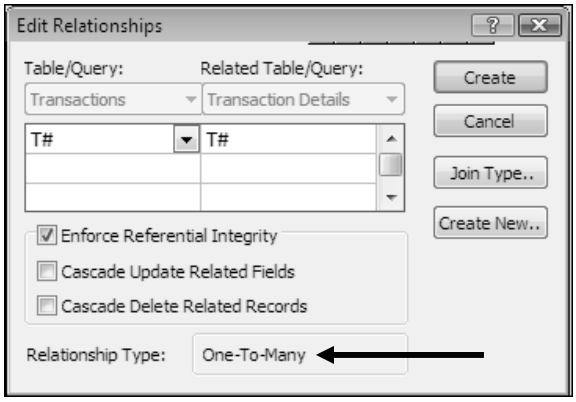
1. The relationship layout area is open.

2. On the *Design* tab in the *Relationships* group, click the *Show Table* button.

3. The Show Table window opens. On the *Tables* tab, select *Transactions* <shift> *Transaction Details* to select both tables and click the **Add** button. Click **Close**.

4. Both tables are displayed in the Relationship layout area. Click and drag the edges of the tables to expand them if necessary to view all field names.

5. The common field in both tables is *T#*. Position the mouse pointer over *T#* in the *Transactions* table list box, hold down the left mouse button, drag the pointer to *T#* in the *Transaction Details* table list box, and release the mouse button. The *Edit Relationships* dialog box appears.

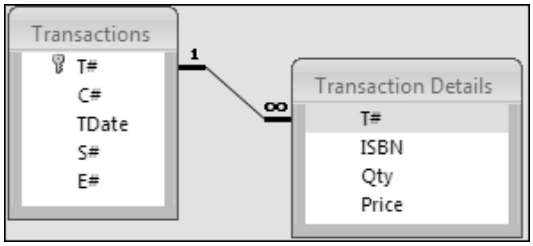
   

   Note the One-to-Many relationship type. Access determined the relationship type based on the common field that was used to join the tables. *T#* in the *Transaction Details* table is a *foreign* key.

6. Click the *Enforce Referential Integrity* box. Click **Create**.

   Note: *T#* is not the primary key of the *Transaction Details* table. In this relationship, it is the *foreign* key that relates to the *primary* key of the *Transactions* table. The infinity symbol (∞) shows the *many* side of the relationship.

For each transaction there may be many transaction details. Transaction details belong to one and only one transaction.



NOTES

CREATING MANY-TO-MANY RELATIONSHIPS

Table Design

In a many-to-many relationship, multiple records in one table can correspond to multiple records in a related table. In our ***Books4U*** database, the relationship between customers and books is that a customer may purchase many books and a particular book may be purchased by many customers. Consider the table design required to show this relationship:

Customers

C#	CFName	CLName	CAddress	CCity	CState	CZip	CPhone	ISBN
627458965	Abgail	Zehper	45 Oakwood	Tempe	AZ	85281	4809996547	1558747524
623179543	Hugo	Redding	15 E Pear	Tempe	AZ	85281	4801155564	938716271
623179543	Hugo	Redding	15 E Pear	Tempe	AZ	85281	4801155564	1558747524

Books

ISBN	Title	Author	QtyOH	Price	P#	C#
938716271	No Excuse	Marjie Markowski	3	11.95	362	623179543
1558747524	The Power of Focus	Jack Canfield	6	14.95	401	627458965
938716271	No Excuse	Marjie Markowski	3	11.95	362	657895123

Linking Fields

In the *Customers* table, *ISBN* is the linking field with the *Books* table. To retrieve more information about the books that Abgail and Hugo have purchased, we take the *ISBN* in the customer record and use it to look-up the *ISBN* in the book table. Conversely, the Books table uses *C#* as the linking field to the Customers table. To retrieve the names of the customers who have purchased a book, we take the *C#* in the book record and use it to look-up the *C#* in the Customers table.

Redundant Data

The challenge created by this design is the large amount of redundant data created. For every book that Hugo purchases, the entire record of information for Hugo must be duplicated. Similarly, for every customer who purchases *No Excuse*, the entire record of information for the book *No Excuse* must be duplicated. The possibility of creating errors when duplicating the data or for modifying the data is vast. For example, a change in Hugo's address would require a change in every record that the address appears. If one record is missed, the integrity of your data has now been violated.

CREATING MANY-TO-MANY RELATIONSHIPS

Junction Tables

To represent a many-to-many relationship, you must create a third table, called a **junction table**, that breaks down the many-to-many relationship into two one-to-many relationships. The primary key from each of the two tables is inserted into the junction table. This eliminates duplicate records and reduces the redundant data. The necessary redundancy is found only in the foreign keys of the junction table.

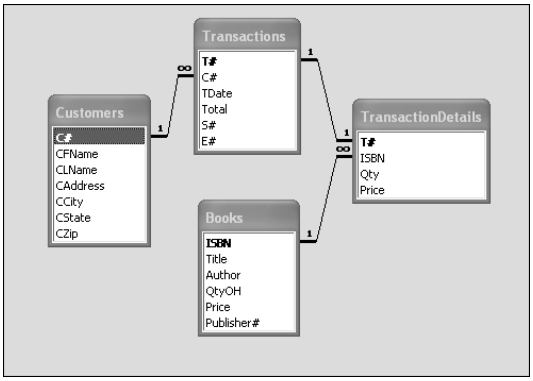
Foreign Keys

The *C#* (primary key) from the *Customers* table and the *ISBN* (primary key) from the *Books* table are placed in the **junction** table and perform as foreign keys to relate to the two tables. Date (and other fields as necessary) is an added field for more information about the purchase *itself*. The foreign keys are the only necessary data redundancy as a result of this modified design.

C#	ISBN	DATE
623179543	938716271	2/3/2008
657895123	938716271	2/5/2008
657895123	1558747524	2/9/2008

Reduce Data Redundancy

Looking closer at the tables in our ***Books4U*** database, we see that the *Transactions* table was created as the junction table to relate *Customers* and *Books*. The *Transaction Details* table reduces the data redundancy that would have been created if that information were left in the *Transactions* table. We now have several one-to-many relationships replacing our many-to-many relationship.

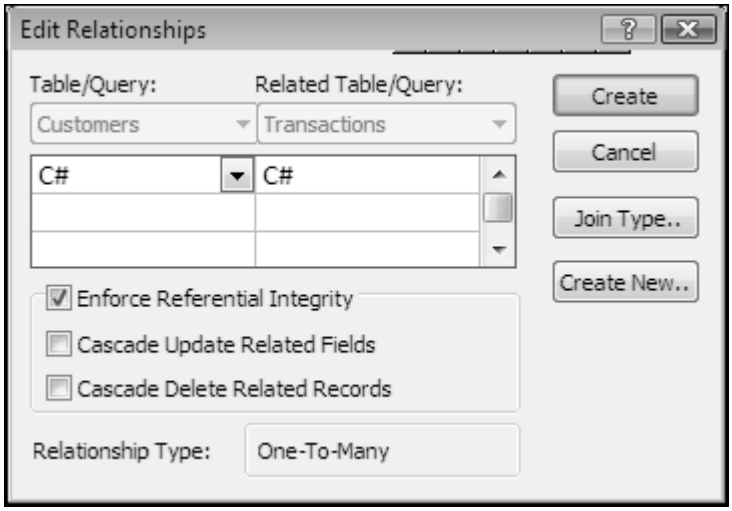


The relationship between Transactions and *Transaction Details* was created in the previous exercise. We will now create the relationship between *Customers* and *Books* using *Transactions* and *Transaction Details* as the **junction** tables.

EXERCISE – CREATING MANY-TO-MANY RELATIONSHIPS

We will follow the same procedure as in the previous exercise in creating one-to-many relationships. The *Transactions* table is already in the relationship layout area and will be used as the **junction** table. *Transaction Details* will also be used to create the relationship between *Customers* and *Books*.

1. The relationship layout area is open.
2. On the *Design* tab in the *Relationships* group, click the *Show Table* button.
3. The Show Table window opens. On the *Tables* tab, select *Books* <shift> *Customers t*o select both tables and click the **Add** button. Click **Close**.
4. Both tables are displayed in the Relationship layout area. Click and drag the edges of the tables to expand them if necessary to view all field names. Reposition the table layout following the handout.
5. Move the *Customers* table list box to the left of the *Transactions* table list box. These two tables have *C#* in common.
6. Position the mouse pointer over *C#* in the *Customers* table list box, hold down the left mouse button, drag the pointer to *C#* in the *Transactions* table list box, and release the mouse button. The *Edit Relationships* dialog box appears.



7. Click the *Enforce Referential Integrity* box. Click **Create**.
8. The *Books* table can be related to *Customers* through the *Transaction Details* table. The *Books* table and the *Transaction Details* table have *ISBN* in common.

EXERCISE – CREATING MANY-TO-MANY RELATIONSHIPS

9. Move the *Books* table list box to the right and below the *Transaction Details* table list box. These two tables have *ISBN* in common.

10. Position the mouse pointer over *ISBN* in the *Books* table list box, hold down the left mouse button, drag the pointer to *ISBN* in the *Transaction Details* table list box, and release the mouse button. The *Edit Relationships* dialog box appears.

11. Click the *Enforce Referential Integrity* box. Click **Create**.

12. Create the relationship between *Employees* and *Transactions* using *E#* as the common linking field.

13. Position the mouse pointer over *E#* in the *Employees* table list box, hold down the left mouse button, drag the pointer to *E#* in the *Transactions* table list box, and release the mouse button. Click the *Enforce Referential Integrity* box. Click **Create**.

14. Add *Shippers* and *Publishers* to the relationship window. Click the *Show Table* button in the Relationships group. On the *Tables* tab, select *Publishers* <shift> *Shippers t*o select both tables and click the **Add** button. Click **Close**.

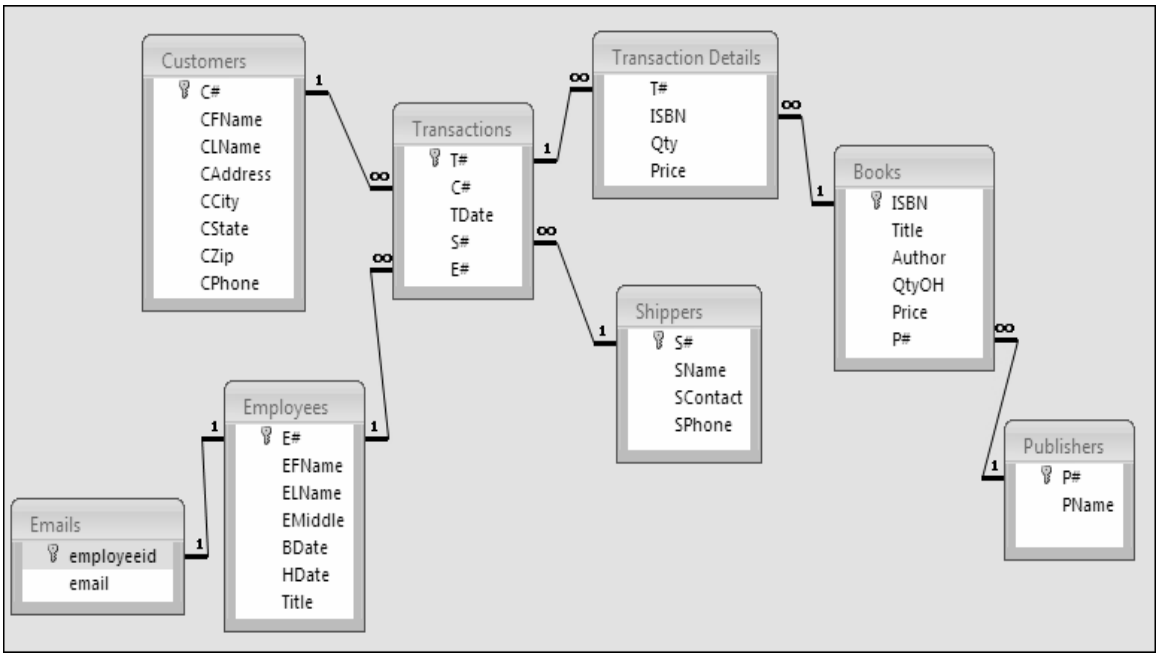
15. Move the *Shippers* table list box below and to the right of the *Transactions* table list box. These two tables have *S#* in common. Position the mouse pointer over *S#* in the *Shippers* table list box, hold down the left mouse button, drag the pointer to *S#* in the *Transactions* table list box, and release the mouse button. Click the *Enforce Referential Integrity* box. Click **Create**.

16. Move the *Publishers* table list box below and to the right of the *Books* table list box. These two tables have *P#* in common. Position the mouse pointer over *P#* in the *Books* table list box, hold down the left mouse button, drag the pointer to *P#* in the *Publishers* table list box, and release the mouse button. Click the *Enforce Referential Integrity* box. Click **Create**.

17. Move the table list boxes in the relationship window so that the relationship links are visible and not crossing over each other.

(See diagram, next page – same as handout)

EXERCISE – CREATING MANY-TO-MANY RELATIONSHIPS



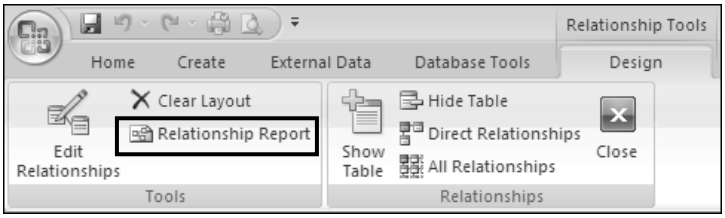
18. When you have the tables positioned so that all relationships are visible and no lines are crossed, **Save** the relationship diagram.

19. To delete any relationship, right-click the relationship line and select Delete or left-click the relationship line and press the Delete key. You will get a warning message from Access to confirm the delete action.

20. To edit any relationship, right-click the relationship line and select Edit Relationship or double-click the relationship line. The Edit Relationships window opens.

21. After making modifications to the relationship diagram, **save** the diagram.

22. To print your report the relationship window must be open. On the *Database Tools* tab, click the *Relationships* button in the *Show/Hide* group. The *Design* tab is activated. On the *Design* tab in the *Tools* group, click the *Relationship Report* button.



23. The report format opens and the *Print Preview* tab is active. In the *Page Layout* group, change print orientation to *Landscape* to fit the diagram to the page. The *Margins* button allows you to modify the layout further if needed. Click the *Print* button.

24. Close the relationship window.

NOTES

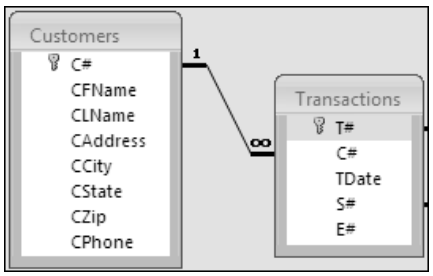
CASCADE OPTIONS

Referential Integrity

When creating relationships, we have the option to enforce referential integrity. This ensures data validity across tables by preventing orphan records and by keeping references synchronized so that there is no data that points to non-existent records.

Orphans

In our ***Books4U*** database there is a one-to-many relationship stated between the *Customers* table and the *Transactions* table. Before we can add a transaction record, the customer referred to in *C#* must exist in the *Customers* table. Similarly, we cannot delete a customer record if there are related transactions for that customer; it would cause orphan transaction records (transactions for a non-existent customer).



Cascade Update and Delete

Two additional options are dimmed until you turn on referential integrity: Cascade Update Related Fields and Cascade Delete Related Fields. Checking these options will instruct Access to change a record in a related table if you make a change in the primary table.

You may encounter a situation where there is a valid need to change one side of a relationship. To keep the data consistent, Access will automatically update the affected rows in the related table as part of a single operation. When you check the Cascade Update Related Fields option, Access ensures that the update is completed in full so that the database is not left in an inconsistent state.

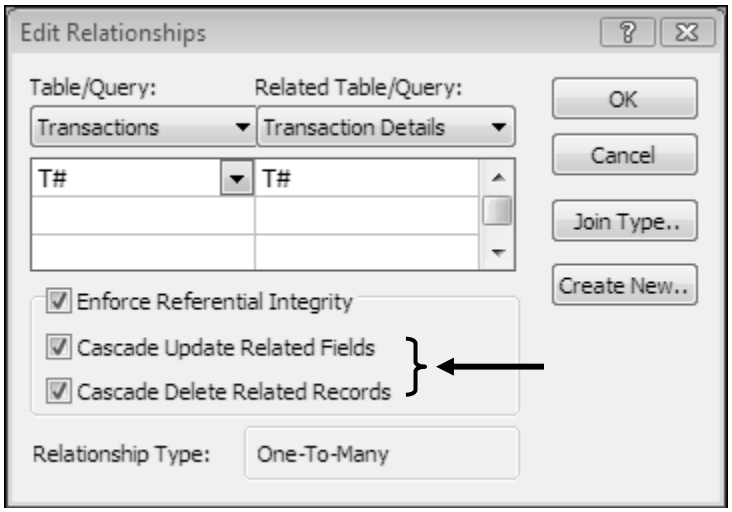
You might need to delete a row and **all related** records. For example, if we deleted a customer from the *Customers* table, all related transactions will be automatically deleted from the *Transactions* table (and all details of the transaction from the *Transaction Details* table) to make certain that no orphan records remain. Use the Cascade Delete Related Fields for this task.

EXERCISE – SET CASCADE OPTIONS

In creating our relationships for ***Books4U***, we set the *Enforce Referential Integrity* option. Access ensures that when entering data into a **related** table, the reference data exists in the **primary** table. We cannot enter a *C#*, *E#*, or *S#* on a transaction unless that customer, employee, or shipper already exists in our database. We also cannot create orphans by deleting a customer and not deleting all related transactions for that customer.

For Access to automatically update and delete related records, implement the Cascade options.

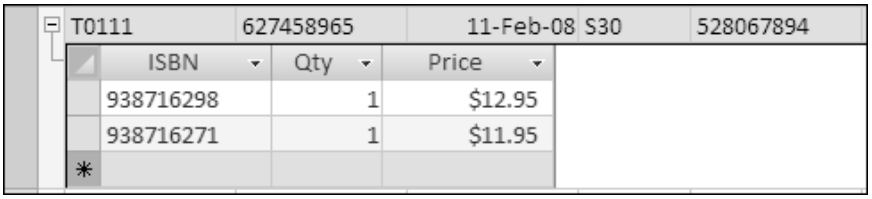
1. Open the relationship window. On the *Database Tools* tab, click the *Relationships* button in the *Show/Hide* group.
2. To edit the *Transactions/Transaction Details* relationship, right-click the relationship line and select Edit Relationship or double-click the relationship line. *The Edit Relationships* window opens.
3. Check the *Cascade Update Related Fields* and *Cascade Delete Related Fields* boxes.
4. Click OK.



EXERCISE – CASCADE DELETE RELATED FIELDS OPTION

5. Open the *Transactions* table. The *Transactions* table (primary table) is related to the *Transaction Details* table.

6. Click the expand indicator (+) for transaction T0111. The *Transaction Details* subdatasheet displays two related records for this transaction. We will delete this transaction from the database.



	T0111	627458965	11-Feb-08	S30	528067894
	ISBN	Qty	Price		
	938716298	1	$12.95		
	938716271	1	$11.95		
*					

7. Click the collapse indicator (-) for transaction T0111.

8. To select the record, click in the gray column to the left of the expand indicator for transaction T0111.

9. In the ribbon on the *Home* tab in the *Records* group, click the *Delete* button. Access displays a warning message. Click **Yes**.

Microsoft Office Access
Relationships that specify cascading deletes are about to cause 1 record(s) in this table and in related tables to be deleted.
Are you sure you want to delete these records?
Yes
No
Help

10. Open the *Transaction Details* table. The result of deleting transaction T0111 from the *Transactions* table **cascaded** down to also delete any related records in the *Transaction Details* table. The *Cascade Delete Related Fields* option ensures that no

	T0110	1559276126	1	$18.00
	T0110	1599869802	1	$4.99
	T0110	451205367	1	$6.99
	#Deleted	#Deleted	########	#Deleted
	#Deleted	#Deleted	########	#Deleted
*				

orphans exist.

11. Closing and re-opening the *Transaction Details* table will erase any records flagged for deletion.

NOTES

QUERIES

Retrieve Data

A query is an Access object designed to retrieve data from one or more tables or queries. A query is much like a filter, but unlike a filter, a query can extract data from multiple sources. The query can be created for various purposes; from a simple selection of a field to complex conditional statements or calculations. Access includes the *Simple Query Wizard* to assist in creating an uncomplicated query.

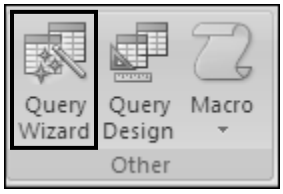
Current Every Time!

As you create the query, Access generates a series of instructions to find and retrieve the desired data. When the data is found, it is displayed in *Datasheet* view. When you save the query for future viewing, Access does not save the *Datasheet* view of the results. Access saves the *instructions* to retrieve the data. This ensures the most **current view** of the data at any given time. The instructions are displayed in *SQL* view.

Because the result of a query is a table, queries can be queried. Access retrieves the queried data first, and then will retrieve data based on those results.

New Query

On the *Create* tab in the *Other* group, there are two options for creating a new query; the *Query Wizard* and *Query Design*. There are four options included in the Wizard.



Query Wizard Options

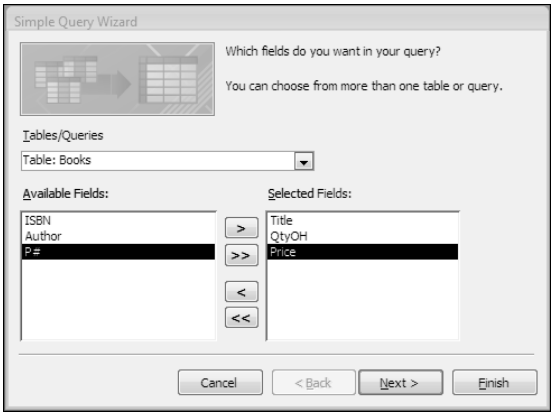
Query	Allows You To
Simple	Select fields from multiple tables and queries. Does not allow specific criteria for the selection.
Crosstab	Calculate totals such as sum, average, and count, and then group them.
Find Duplicates	Find duplicate field values.
Find Unmatched	Find records in a table with no related records in another table; for example customers with no transactions.

EXERCISE – QUERY WIZARD (SIMPLE)

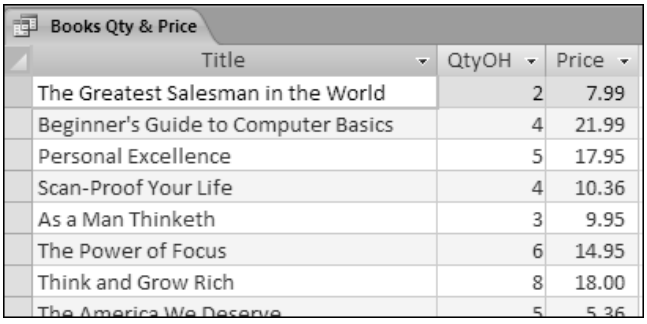
The *Simple Query Wizard* is the easiest way to create a query. However, it is also the most limited. You cannot order the data, nor can you request specific data.

Retrieve a listing of the books in our database. Include *title*, *quantity*, and *price*.

1. Close all database objects.
2. In the ribbon on the *Create* tab in the *Other* group, click the *Query Wizard* button. Click *Simple Query Wizard* and then **OK**.
3. Choose the table and fields that you want in the result. In the *Table/Queries* textbox, use the pull-down menu and select the *Books* table.
4. Under *Available Fields*, double-click *Title*, *QtyOH*, and *Price*. This action adds those fields to the *Selected Fields* list in the order you would like them displayed in the result. Click **Next**.



5. In the next window, keep the default choice to view *Details*. Click **Next**.
6. Name the query *Books Qty & Price*. Click **Finish**.



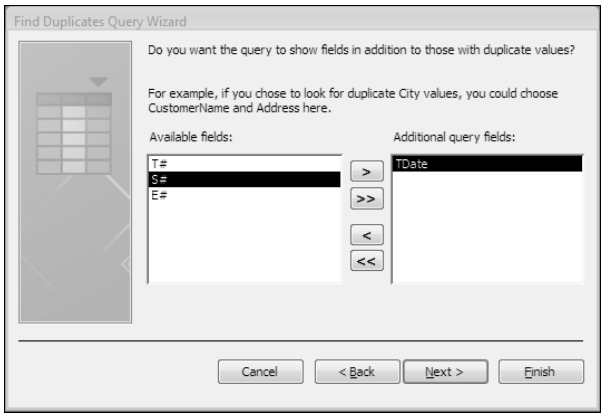
Title	QtyOH	Price
The Greatest Salesman in the World	2	7.99
Beginner's Guide to Computer Basics	4	21.99
Personal Excellence	5	17.95
Scan-Proof Your Life	4	10.36
As a Man Thinketh	3	9.95
The Power of Focus	6	14.95
Think and Grow Rich	8	18.00
The America We Deserve	5	5.36

7. Close the result window. The result instructions are automatically saved.

EXERCISE – QUERY WIZARD (FIND DUPLICATES)

We want to know who our repeat customers are.

1. In the ribbon on the *Create* tab in the *Other* group, click the *Query Wizard* button. Click *Find Duplicates Query Wizard* and then **OK.**
2. Choose the table you want to search for duplicate values. Repeating *C#* in the *Transactions* table tells us that the customer has purchased from us more than once. Click on the *Transactions* table and then **Next**.
3. Choose the field that may contain duplicate information. Under *Available Fields*, double-click *C#*. This action adds the fields to the *Duplicate-value Fields* list. Click **Next**.
4. Double-click any additional fields you would like to see in the query result. Double-click *TDate*. Click **Next**.



5. Name the query ***Repeat Customers*** and click **Finish**.
6. The result displays the C# and date of each transaction for repeat customers.

Repeat Customers

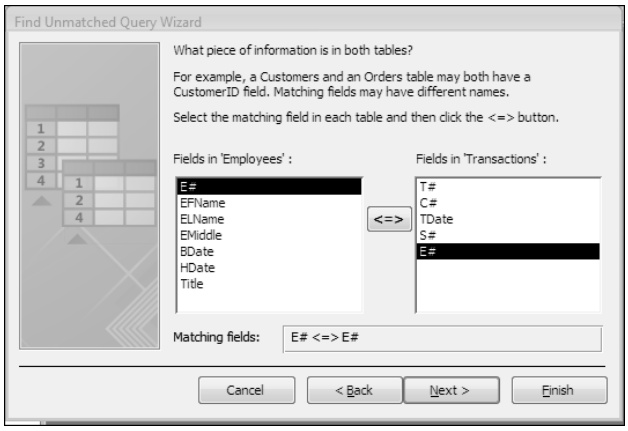
C#	TDate
627458965	07-Feb-08
627458965	31-Jan-08
658652654	11-Feb-08
658652654	05-Feb-08

7. Close the result window. The result instructions are automatically saved.

EXERCISE – QUERY WIZARD (FIND UNMATCHED)

Retrieve a list of employees who have not sold any books. Include first and last name of the employee, hire date, and title.

1. In the ribbon on the *Create* tab in the *Other* group, click the *Query Wizard* button. Click *Find Unmatched Query Wizard* and then **OK.**
2. Our data is coming from the *Employees* and *Transactions* tables. In this window we identify *Employees* as the table which may have no related data. Select the *Employees* table. Click **Next**.
3. Select *Transactions*. The *Transactions* table contains the related data. Click **Next**.
4. The next window requests the linking field between the two tables. Select *E#* for both tables. Click **Next**.



5. Double-click *EFName*, *ELName*, *HDate*, and *Title* in the *Available fields* list to add the data to the *Selected fields* list. These fields will be in the query result. Click **Next**.
6. Name the query *Employees Not Selling Books*. Click **Finish**.

Employees Not Selling Books

EFName	ELName	HDate	Title
Lori	Jones	8/21/2005	Bookkeeper
Harry	Peters	9/5/2005	StockPerson

7. Close the result window. The result instructions are automatically saved.

SELECT QUERIES IN DESIGN VIEW

Query Structure

For more flexibility in retrieving data use the *Query Design* feature. Creating a query in *Design* view gives you added control in creating the query structure. Data can be retrieved from multiple sources as with the Wizard. Data can be further restricted in *Design* view by specifying conditions for a field; select customers in one city, examine transactions on a specific day, or obtain a list of books from a particular publisher. Results can also be ordered.

Query Types

The types of queries created with the Wizard are ***Select*** queries. These queries display selected fields from one or more tables. In addition to *Select* queries, ***Action*** queries can be created in *Design* view. Action queries make changes to data or the data structure in the database. Four types of Action queries are available in Access; update, append make-table and delete. More about *Action* queries in the next section.

Steps to Create Select Queries in Design View

1. On the *Create* tab in the *Other* group, click the Q*uery Design* button. The Query grid and Show Table windows display.
2. From the Show Table window, select the desired table(s). Click the **Add** button for each table. Click **Close**.
3. From the table(s) field list, double-click the required fields to move them down into the query grid. **Select the fields in the order you want them to appear in the datasheet**.
4. Enter **Criteria** to restrict the data retrieved. Use the **Sort** feature to order the data. Click **Show** to display the field.
5. Save and name the new query. Toggle to *Datasheet* view.

EXERCISE –SELECT QUERIES (ADDING CRITERIA)

Create an alphabetical listing of all books published by **Wildside Press**. Display the *ISBN, Title, Author*, and *Publisher Name*.

1. Close all database objects.

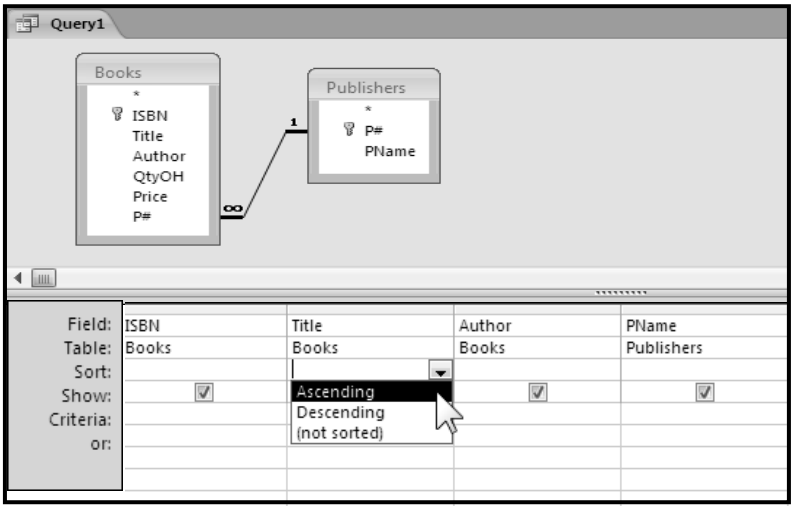
2. In the ribbon on the *Create* tab in the *Other* group, click the *Query Design* button. The *Show Table* dialog box opens. *(we used this dialog box to create our relationship diagram)*

3. Select the tables or queries where the required data resides. ISBN, Title, and Author are in the Books table. Publisher Name is in the *Publishers* table. Select the *Books* table, press and hold the *Ctrl key*, and select the *Publishers* table. Release the *Ctrl key*. Click **Add**. Click **Close**.

   The top portion of the query window shows the table field lists and the relationships between the tables. The bottom portion, or *design grid*, represents the columns in the query results that will be displayed in datasheet view. Place the field names on the grid in the order that you want the fields displayed in the query results. Double-clicking the field name in the table field list adds the field to the grid columns.

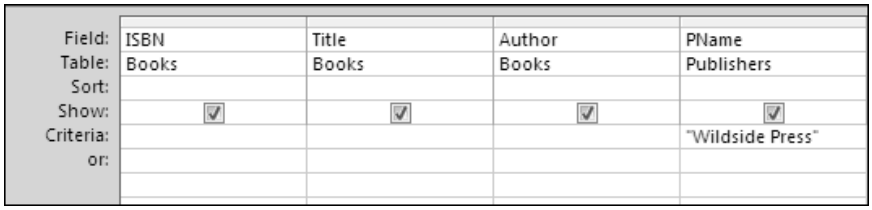
4. Double-click the *ISBN* field in the *Books* field list. Double-click *Title* and then double-click *Author*. Publisher name comes from the *Publishers* field list. Double-click *PName*. The grid displays the field names and table names of the required data.

5. We have all of the required fields. We must now tell Access to display the results alphabetically by book Title. Click the *Sort* row in the *Title* column. Choose **Ascending** from the drop-down menu.



EXERCISE –SELECT QUERIES (ADDING CRITERIA)

6. Restrict the data result further by specifying the Publisher's name. The query calls for those books published by **Wildside Press**. In the *Pname* column on the Criteria row, type *Wildside Press*.



Field:	ISBN	Title	Author	PName
Table:	Books	Books	Books	Publishers
Sort:				
Show:	☑	☑	☑	☑
Criteria:				"Wildside Press"
or:				

7. Toggle to *Datasheet* view. Access displays the result of the query.

ISBN	Title	Author	PName
761140670	Never Too Late to Love a Computer	Abby Stokes	Wildside Press
521528747	Global Warming: The Complete Briefing	John Houghton	Wildside Press
451205367	The Richest Man in Babylon	George S. Clanson	Wildside Press
1599869802	Acres of Diamonds	Russell H. Conwell	Wildside Press
446394599	Lincoln on Leadership	Donald T. Phillips	Wildside Press
979738504	Lawyers are Liars	Mark J. Kohler	Wildside Press

When you save the query, Access does not save this result. The instructions that were automatically generated to run the query are saved. If another book published by *Wildside Press* was added to the *Books* table immediately after we ran this query, we would want to see that book in the result the next time we requested the data. By saving the instructions, every time we request this data, Access will run the instructions to renew the result, thus ensuring that the most current data is displayed.

8. On the *Home* tab in the *Views* group, click the drop-down list and select *SQL View*.

```
SELECT Books.ISBN, Books.Title, Books.Author, Publishers.PName
FROM Publishers INNER JOIN Books ON Publishers.[P#] = Books.[P#]
WHERE (((Publishers.PName)="Wildside Press"))
ORDER BY Books.Title;
```

The instructions to create the query are shown above. When you save the query, it is these instructions that are saved. When you click the query name in the Navigation Pane, Access retrieves this set of instructions, executes them, and displays the result.

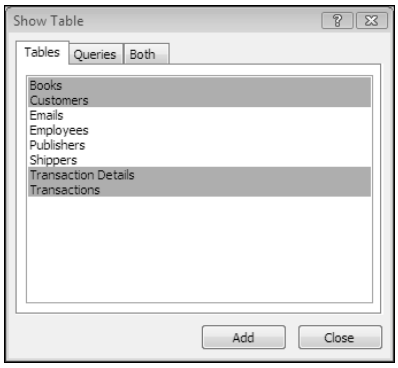
9. **Save** the query by clicking the close button × on the query window. Name the query *Wildside Press Books*.

EXERCISE – SELECT QUERIES (CONDITIONAL - AND/OR)

A book order is coming in late. We need to alert *Chandler* customers who have purchased copies of *Think and Grow Rich* and *Leadership*. List the customer's name and phone number as well as the date of purchase and the price paid.

1. Close all database objects.

2. In the ribbon on the *Create* tab in the *Other* group, click the *Query Design* button. The *Show Table* dialog box opens.

   Select the source data. Customer name and phone are in the *Customers* table. Date of purchase is stored in the *Transactions* table. The *Transaction Details* table stores the price paid. To locate the titles of books we need the *Books* table.

3. Select the *Books* table, press and hold the *Ctrl key*, and select the *Customers, Transaction Details, and Transactions* tables. Release the *Ctrl key*. Click **Add**. Click **Close**.

4. Double-click the *CFName, CLName, CPhone,* and *CCity* fields in the *Customers* field list. Double-click *Title* from the *Books* field list. Next, double-click *TDate* from the *Transactions* field list. Finally, double-click *Price* from the *Transaction Details* field list. The grid displays the field names and table names of the required data.

   We now have all of the required fields. We must now tell Access to limit the display of results to Chandler customers.

5. Click the *Criteria* row in the *CCity* column. Type **"Chandler"**.

   Not only do we want to see customers from *Chandler*, we want to see specific book titles purchased by those customers. Placing criteria statements into more than one field creates an **AND** condition.

6. Click the *Criteria* row in the *Title* column. Type **"Think and Grow Rich"**. (*quotes*)

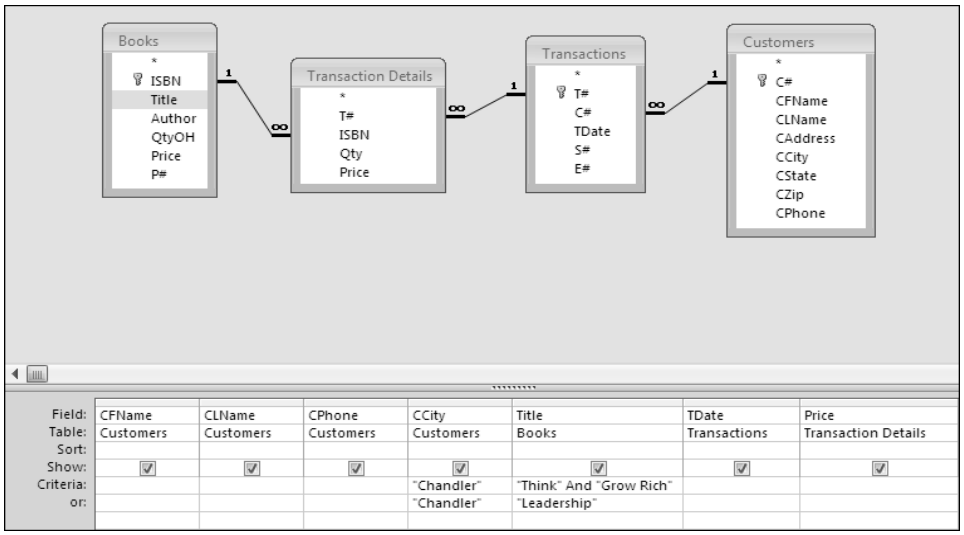
   We are also looking for purchases of the book, *Leadership*. Placing more than one criteria statements into one field creates an **OR** condition.

7. Click the *Or row* in the *Title* column. Type **"Leadership"**.

   The grid thus far shows that we are searching for *Chandler* customers who have purchased *Think and Grow Rich*, and any customers who have purchased *Leadership*. We must specify that the book *Leadership* was also purchased by *Chandler* customers.

8. Click the *Or row* in the *CCity* column. Type **"Chandler"**.

EXERCISE – SELECT QUERIES (CONDITIONAL - AND/OR)



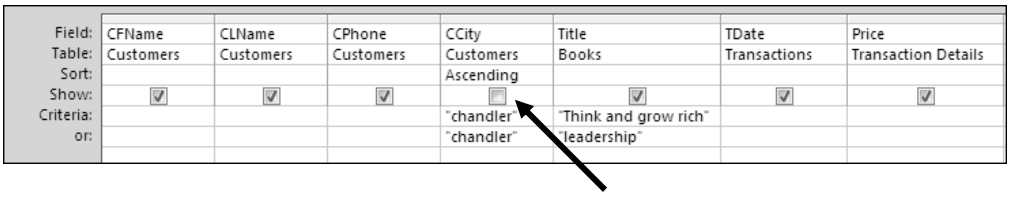
9. Toggle to *Datasheet* view. Access displays the result of the query.

CFName	CLName	CPhone	CCity	Title	TDate	Price
Justin	Sweeny	6028886542	Chandler	Think and Grow Rich	11-Feb-08	$18.00
Sara	Hardy	6025587456	Chandler	Leadership	08-Feb-08	$17.98
Justin	Sweeny	6028886542	Chandler	Think and Grow Rich	05-Feb-08	$18.00

When creating this query, it is necessary to include the *CCity* field in the query grid to restrict the results to *Chandler* customers. However, as the results show, CCity is an unnecessary duplication. We know that the city will be *Chandler* as this is the only city we were searching. The *CCity* field can be **hidden** in the Datasheet View.

10. Toggle back to *Design* View.

11. Uncheck the *Show* box in the *CCity* column. Toggle to *Datasheet* View.


Field: CFName CLName CPhone CCity Title TDate Price
Table: Customers Customers Customers Customers Books Transactions Transaction Details
Sort: Ascending
Show:
Criteria: "chandler" "Think and grow rich"
or: "chandler" "leadership"

12. **Save** the query by clicking the close button on the query window. Name the query *Late Chandler Order*.

NOTES

SELECT QUERIES (CALCULATIONS)

Calculated Field

Expressions can be used to create calculated fields in a query. The calculated field is a result that derives its values from calculations performed on other fields. The calculated field is not entered by the user, nor is it stored in the database. The value of a calculated field changes each time the table fields are updated and the query is executed.

Expressions

Expressions can be combinations of functions, field names, numbers, text, and operators. Expressions can be created to calculate totals, count records, join first and last names, or perform mathematical projections.

Naming the Calculated Result

Field names used by an expression are enclosed in square brackets. The result field name precedes the expression followed by a colon. For example, to calculate a 5% increase in sales, the expression is stated as: *Profit: [Sales]*1.05*.

Steps to Create a Calculated Field

1. On the *Create* tab in the *Other* group, click the Q*uery Design* button. The Query grid and Show Table windows display.
2. From the Show Table window, select the desired table(s). Click the **Add** button for each table. Click **Close**.
3. From the table(s) field list, double-click the required fields to move them down into the query grid. **Select the fields in the order you want them to appear in the datasheet**.
4. Enter **Criteria** to restrict the data retrieved. Use the **Sort** feature to order the data. Click **Show** to display the field.
5. In a blank column of the criteria grid, enter an expression in the Field row.
6. On the *Query Tools Design* tab in the *Show/Hide* group, click the *Property Sheet* button. In the *Format* property box, use the pull-down menu to display field formats. Click the appropriate format. Click the close button at the top right of the *Property Sheet* task pane.
7. Enter sort and criteria information for the new field, if desired. Toggle to *Datasheet* view.
8. Save and name the new query.

EXERCISE – SELECT QUERIES (CALCULATIONS)

Calculate the total price for each detail in a transaction (Total Price = Qty * Price). Show transaction number, customer's last name, ISBN, qty, price, and total price in the result.

1. Close all database objects.

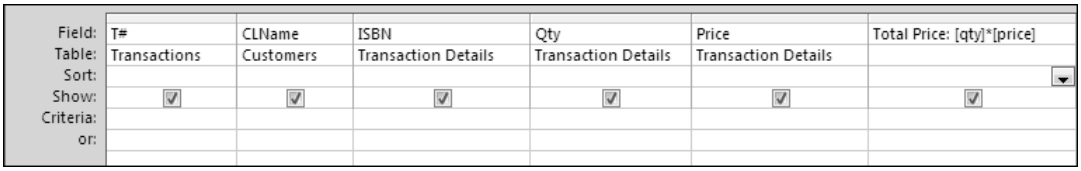
2. In the ribbon on the *Create* tab in the *Other* group, click the *Query Design* button. The *Show Table* dialog box opens.

   Select the source data. Customer name is in the *Customers* table. Transaction number, ISBN, qty and price are in the *Transaction Details* table. The *Transactions* table shows the relationship **(junction table)** between *Customers* and *Transaction Details*.

3. Select the *Customers* table, press and hold the *Ctrl key*, and select the *Transaction Details, and Transactions* tables. Release the *Ctrl key*. Click **Add**. Click **Close**.

4. Double-Click *T#* in the *Transactions* field list. Next, double-click the *CLName* field in the *Customers* field list. Double-click *ISBN*, *Qty*, and *Price* in the *Transaction Details* field list. The grid displays the field names and table names of the required data stored in the database.

5. Click in the Field row in the blank column next to Price. Type the expression:
   Total Price: [qty]*[price]



Field:	T#	CLName	ISBN	Qty	Price	Total Price: [qty]*[price]
Table:	Transactions	Customers	Transaction Details	Transaction Details	Transaction Details	
Sort:						
Show:	☑	☑	☑	☑	☑	☑
Criteria:						
or:						

6. On the *Query Tools Design* tab in the *Show/Hide* group, click the *Property Sheet* button. In the *Format* property box, use the pull-down menu to display field formats. Select *Currency*. Click the close button at the top right of the *Property Sheet* task pane. Toggle to *Datasheet* View.

T#	CLName	ISBN	Qty	Price	Total Price
T0100	Singer	055327757X	1	$7.99	$7.99
T0100	Singer	446530697	1	$13.99	$13.99
T0102	Zehper	1558747524	2	$14.95	$29.90
T0103	Gilles	766825361	1	$17.98	$17.98
T0103	Gilles	785288376	1	$24.99	$24.99
T0104	Frank	1557423601	1	$9.95	$9.95

7. **Save** the query by clicking the close button on the query window. Name the query *Qty * Price.*

ACTION QUERIES IN DESIGN VIEW

Change Data or Data Structure

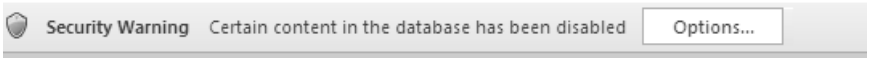
Action queries make changes to data or the data structure. Four types of Action queries are available in Access; update, append make-table and delete.

Disabled Mode

By default, Access disables all action queries unless your database resides in a trusted location. If you try to run an action query and it seems like nothing happens, check the Access status bar at the bottom of the screen for the following message:

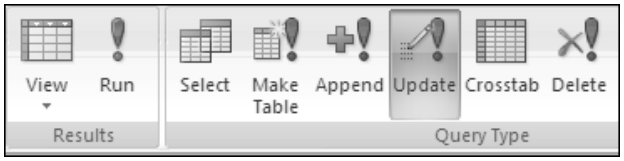
This action or event has been blocked by Disabled Mode.

On the *Message Bar* click the Options button. The *Microsoft Office Security Options* dialog box appears. Click *Enable this Content* and then click *OK*. (see page 7) Run the query again.



Run to Update

To run an Action query, first change the query type by clicking the appropriate button on the *Query Tools Design* tab, *Query Type* group. In the *Results* group, click the *Run* button. Clicking the *Run* button will update the values in the database. Once you create and run an update query, you cannot undo the changes, therefore use with caution. It is a good idea to make a copy of the table(s) first and practice your update query before running the query on the original table.



Action Query Types

Query	Action
Update	Add, change, or delete the data in one or more existing records. Queries can accept multiple criteria, allows updates to a large number of records at a time, and can change data in more than one table at a time.
Append	Adds a set of records from one or more tables (source) to the bottom of one or more tables (destination).
Make-table	Creates a new table from data in an existing table or query.
Delete	Deletes records based on specific criteria. Data should be backed-up prior to the delete as deletes cannot be undone.

EXERCISE – ACTION QUERIES (UPDATE)

Possibility Press is under new ownership. Change the name to *Simon & Schuster*.

1. Close all database objects.

2. In the ribbon on the *Create* tab in the *Other* group, click the *Query Design* button. The *Show Table* dialog box opens.

   Select the source data. Publisher name is in the *Publishers* table.

3. Select the *Publishers* table. Click **Add**. Click **Close**.

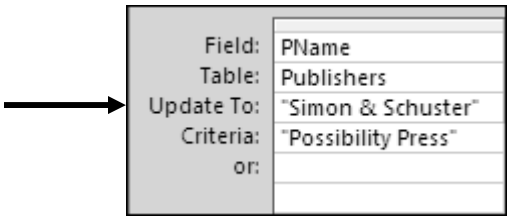
4. Double-Click *PName* in the *Publishers* field list. The grid displays the field name and table name of the required data.

5. Click the *Criteria* row in the *PName* column. Type ***"Possibility Press"***. This is the specific data we are seeking.

   We need to change *PName* to reflect the new ownership of the Publisher. However, there are no field properties that will allow us to make the change. By default, Access presents us with a query grid for a ***Select*** query. We need the query grid for an ***Action*** query; therefore, we need to change the *query type* before we can continue.

6. On the *Query Tools Design* tab in the *Query Type* group, the *Select* button is active signifying that we have a *Select* query grid. Click the ***Update*** button. The ***Update To*** property now appears on the grid.

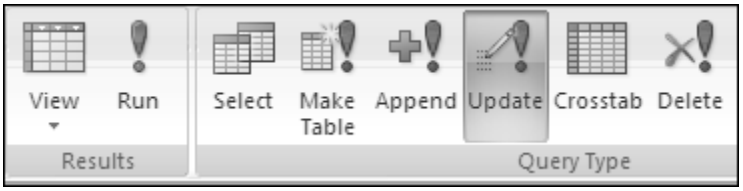
7. Click the ***Update To*** row in the *PName* column. Type ***"Simon & Schuster"***. Be sure to include the (**&**) symbol within the quotation marks.



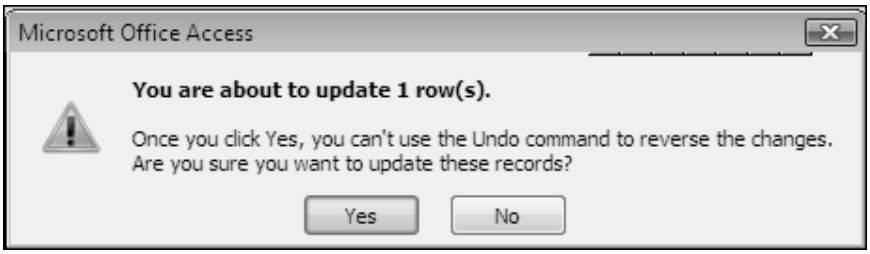
   If we simply toggle to *Datasheet* View, we do not see the results of the query as with the ***Select*** query. What is displayed is the data that will be changed. In order to update the values, we must *Run* the query.

EXERCISE – ACTION QUERIES (UPDATE)

On the *Query Tools Design* tab in the *Results* group is the *Run* button. Notice that the symbol identifying the Run action is an exclamation mark (!). Also notice that the exclamation mark is included on all ***Action*** query buttons. All ***Action*** queries must be Run before the changes take place in the database.



8. On the *Query Tools Design* tab in the *Results* group click the *Run* button. Access displays a warning message that data will be updated and that the operation cannot be undone. Click **Yes**.


Microsoft Office Access
You are about to update 1 row(s).
Once you click Yes, you can't use the Undo command to reverse the changes.
Are you sure you want to update these records?
Yes
No

9. To view the results of the update, open the *Publishers* table. Simon & Schuster is now the *PName* for publisher #324.

P#	PName
100	Success Publishers
261	Wildside Press
324	Simon & Schuster
362	Warner Books
401	Adison Wesley
435	Rich Press

10. It is not necessary to save this query. Close the query window. Click **No**.

EXERCISE – ACTION QUERIES (MAKE-TABLE)

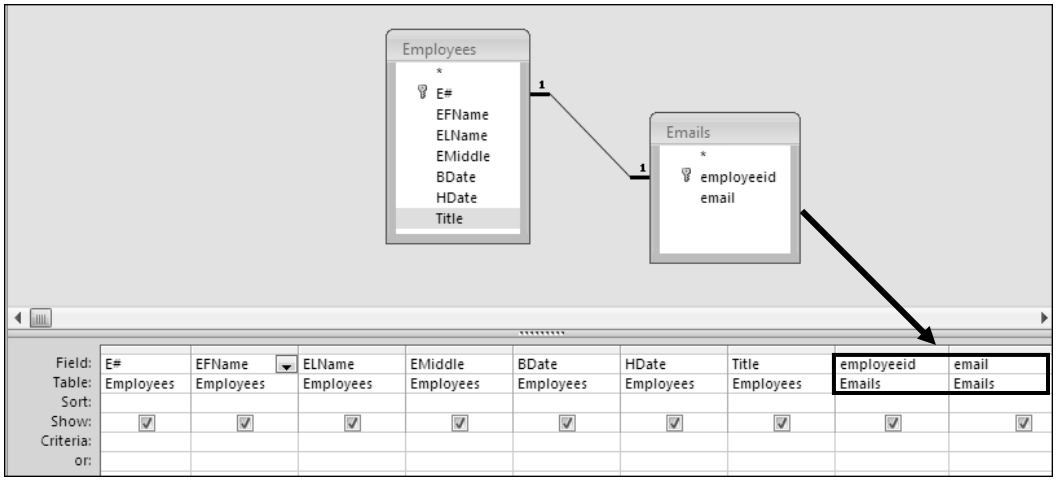
The ***Books4U*** database contains an *Employees* table and an *Emails* table. Our relationship diagram shows a *one-to-one* relationship between these two tables. It was stated earlier that one-to-one relationships are rarely included in the database; depending on the amount of data, it may be more efficient to combine the tables.

The employee's email address was overlooked during the design phase of **Books4U** and was added later into another table. Because email adds only one more field, we can combine the data in these two tables (using a query) without having to manually enter the email address into the *Employees* table. Once the data is combined we then make the query our new *Employees* table so that the data is **physically stored**. Subsequent emails will then be entered into the *Employees* table and the need for the *Emails* table is no longer necessary.

1. Close all database objects.
2. In the ribbon on the *Create* tab in the *Other* group, click the *Query Design* button. The *Show Table* dialog box opens.
3. Select the *Emails* table, press and hold the *Ctrl key*, and select the *Employees* table. Release the *Ctrl key*. Click **Add**. Click **Close**.

We want to select all fields from both tables in the **same order** as in the current *Employees* table. We will select the emails from the *Emails* table and place it after the *title* field. Include the *employeeid* from the *Emails* table in the grid to **verify** that the data in the linking field matches.

4. Double-Click the fields (one at a time) from the *Employees* field list. Next, double-click the fields from the *Emails* field list. The grid displays the field names and table names of the required data stored in the database. The last two fields are from the *Emails* table.



EXERCISE – ACTION QUERIES (MAKE-TABLE)

5. Toggle to *Datasheet View*. Verify that the email address is the correct address for that employee. To do this, compare the *employeeid* and *E#* fields. They should match.

When Access combines data from two tables, it will join the tables based on the relationship in our relationship diagram as shown above the query grid. In this case, the linking fields are *employeeid/E#*. Access will join these fields based on an exact match of the **data** contained in the fields. *(Notice that the names of the fields do not have to match.)*

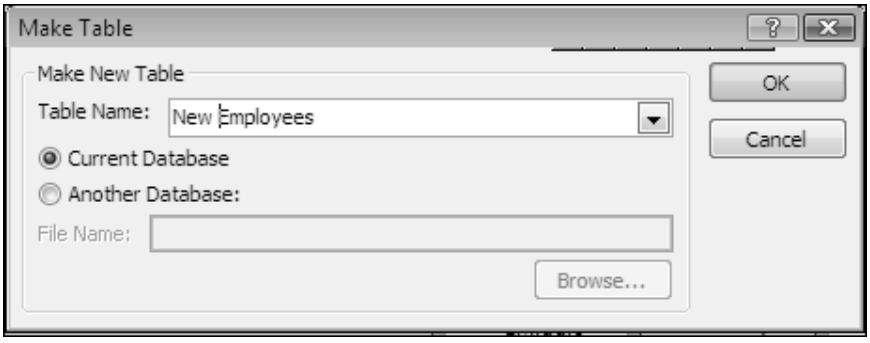
E#	EFName	ELName	EMiddle	BDate	HDate	Title	employeeid	email
318-20-6119	Patricia	Yee	J	7/27/1987	9/17/2005	Cashier	318-20-6119	cindy.alpha@maricopa.edu
325-67-8902	Lori	Jones	M	11/10/1973	8/21/2005	Bookkeeper	325-67-8902	j54@yahoo.com
427-51-6969	Harry	Peters	H	1/15/1990	9/5/2005	StockPerson	427-51-6969	HP23@gmail.com
513-45-6789	Ana	Rivera	T	5/12/1977	8/10/2005	Manager	513-45-6789	ariv@bks4u.com
526-40-7823	John	Bullock	O	3/30/1986	9/25/2005	Cashier	526-40-7823	letitsnow@hotmail.com
528-06-7894	Betty	Smith	P	9/3/1988	9/7/2005	SalesPerson	528-06-7894	holidayfun@google.com

6. Toggle back to *Design View*. Now that you've verified that the employeeid fields match, you no longer need the employeeid field from the *Emails* table. Delete it by clicking the area in the grid directly above the employeeid field name to select the column and pressing the **Delete key**. Toggle back to *Datasheet* View. Your result now shows the original *Employees* table including the *email* field.

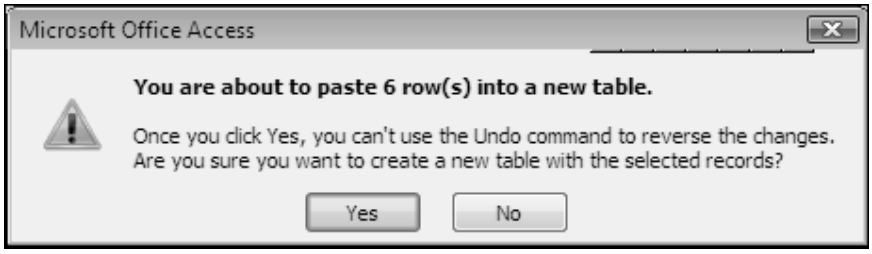
7. **Save** the query by clicking the *Save* button on the *quick access toolbar*. Name the query *Employees & Emails.* Leave the query open in *Design* View.

We now want to replace the original *Employees* table with the query result that we just created. As a query, the result data is not stored – only the instructions to re-create the query are stored. We want the results to be stored as the original table, so we have to make our query a table.

8. In the ribbon on the *Query Tools Design* tab in the *Query Type* group, click the *Make Table* button. The Make Table dialog box opens. In the Table Name textbox, name the new table *New Employees*. Click **OK**.



9. On the *Query Tools Design* tab in the *Results* group click the *Run* button. Access displays a warning message that data will be inserted into a new table and that the operation cannot be undone. Click **Yes**.


Microsoft Office Access
You are about to paste 6 row(s) into a new table.
Once you click Yes, you can't use the Undo command to reverse the changes.
Are you sure you want to create a new table with the selected records?
Yes
No

10. Examine the new table. On the Navigation pane, double-click the *New Employees* table.

11. We now want our *New Employees* table to be the original; all subsequent queries will now be based on this table. Currently, we have queries in ***Books4U*** that are based on the old *Employees* table. We need to change the names of the tables to reflect the change in data.

12. Close the *New Employees* table.

13. Right-click the *Employees* table in the Navigation pane. Select **Rename** from the drop-down list. Rename the table ***Old Employees***.

14. Right-click the New Employees table in the Navigation pane. Select **Rename** from the drop-down list. Rename the table ***Employees***.

15. Open the *Employees* table in *Design* View. Set *E#* as the primary key. **Save** the table. Close the *Employees* table.

16. Delete the *Old Employees* table. Right-click the table in the Navigation pane. Select Delete. Click **Yes** to destroy all relationships to the *Old Employees* table.

17. Check the relationship diagram. On the *Database Tools* tab in the *Show/Hide* group, click the *Relationships* button. The relationship between *Employees* and *Transactions* has been deleted. We need to recreate it.

18. Position the mouse pointer over *E#* in the *Employees* table list box, hold down the left mouse button, drag the pointer to *E#* in the *Transactions* table list box, and release the mouse button. Click the *Enforce Referential Integrity* box. Click **Create**.

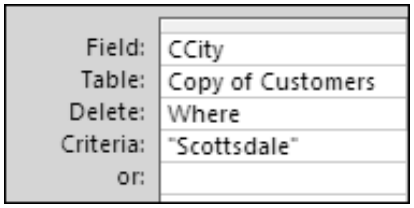
19. Close the *Employees & Emails* query. Click **Yes** to save the changes. Close the relationship layout. Save the changes.

EXERCISE – ACTION QUERIES (DELETE)

A Delete query allows you to delete **records** from database tables. Use with caution as you cannot undo the changes. Make a copy of the table(s) first and practice your delete query on the copied table before running the query on the original table.

Delete all *Scottsdale* customers from the database.

1. Close all database objects.
2. Make a copy of the *Customers* table. Single-click on the *Customers* table in the Navigation Pane to select it. Click the *Office* button and select *Save As* from the drop-down menu. Click *Save Object As*.
3. In the *Save As* dialog box, the *Save Customers To* textbox defaults to the name, *Copy of Customers.* Click **OK**.
4. The *Copy of Customers* table opens in *Datasheet* view. Click on the *CCity* column header. The column is selected.
5. On the *Home* tab, *Sort& Filter* group, click the *Ascending* key to sort the city names in alphabetical order. Examine the data. There are 7 records displaying Scottsdale.
6. Close the table. Click **Yes** to save the design changes.
7. Click the *Create* tab. In the *Others* group, click the *Query Design* button. The *Show Table* dialog box opens.
8. Select the *Copy of Customers* table. Click **Add**. Click **Close**.
9. We are deleting all customer **records** that contain Scottsdale in the CCity column. Double-click the *CCity* field from the *Copy of Customers* field list.
10. On the query grid in the *Criteria* row of the *CCity* column, type **"Scottsdale"**. This is the specific data we are seeking.
11. On the *Query Tools Design* tab in the *Query Type* group, click the ***Delete*** button. The ***Delete*** property now appears on the grid. The default instruction for this property is "Where". The instruction that will be executed is; **delete all records from the *Copy of Customers* table where the *CCity* data = Scottsdale.**



EXERCISE – ACTION QUERIES (DELETE)

12. On the *Query Tools Design* tab in the *Results* group click the *Run* button to make the changes in the database. Access displays a warning message that data will be deleted from the table and that the operation cannot be undone. Click **Yes**.

Microsoft Office Access
You are about to delete 7 row(s) from the specified table.
Once you click Yes, you can't use the Undo command to reverse the changes.
Are you sure you want to delete the selected records?
Show Help >>
Yes
No

13. Click the **Close** button the *query1* window. Click **No** to save the changes.
14. In the Navigation pane, double-click the *Copy of Customers* table to open it.
15. Examine the data. Notice that the 7 Scottsdale records have been deleted. Again, this is a permanent deletion.
16. Click on the **Close** button on the *Copy of Customers* table.
17. In the Navigation pane, right-click the *Copy of Customers* table. On the pull-down menu, left-click **Delete**. Click **Yes** to delete the table from the database.

CALCULATING AGGREGATES

Expressions

In a previous section we saw that *expressions* can be used in a query to create calculated **fields** on a single record. The calculated field is derived from other fields and is not stored in the database.

Aggregates

With aggregate *functions* such as Sum, Avg, Min, Max, or Count Access **groups** records and then performs calculations on the **group**. When an aggregate function is used, Access displays one row in the query result datasheet for each group. The aggregate is considered a *summary* of the group.

Column Headings

Access assigns column headings in the query results datasheet using the function name, the word *Of*, and the field name from which the function has been derived. For example, adding the data in the *Sales* column would have a heading; *SumOfSales*.

Totals in Table Datasheet View

A new feature in Access 2007 allows you to include an aggregate function on your database tables using the *Totals* button on the ribbon. The totals row appears beneath the asterisk (*) row. The aggregate function on database tables will total selected columns of the entire table. You cannot calculate totals based on a specific data item. For example, you cannot count total sales for a particular book.

Once you have defined aggregates for your table, they can never be removed. They can however, be *hidden* from view. The Totals button acts as a toggle between hidden aggregates and visible aggregates.

Totals in Queries Design View

An aggregate function can also be performed on one or more columns of a query result set without having to change the design of your query. Calculating totals for queries is more flexible; data can be categorized into groups and totals can be calculated for each group. Calculating total sales for a particular book is possible in this case.

Use the *Totals* button in *Design* view to add a Totals row to the query grid. Several aggregate options are available to choose from.

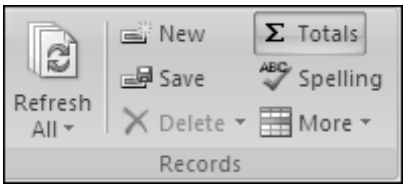
EXERCISE - CALCULATING AGGREGATES (ON TABLES)

1. Close all database objects.

2. Make a copy of the *Transaction Details* table. Single-click on the *Transaction Details* table in the Navigation Pane to select it. Click the *Office* button and select *Save As* from the drop-down menu. Click *Save Object As*.

3. In the *Save As* dialog box, the *Save Transaction Details To* textbox defaults to the name, *Copy of Transaction Details.* Click **OK**. The table opens in *Datasheet* view.

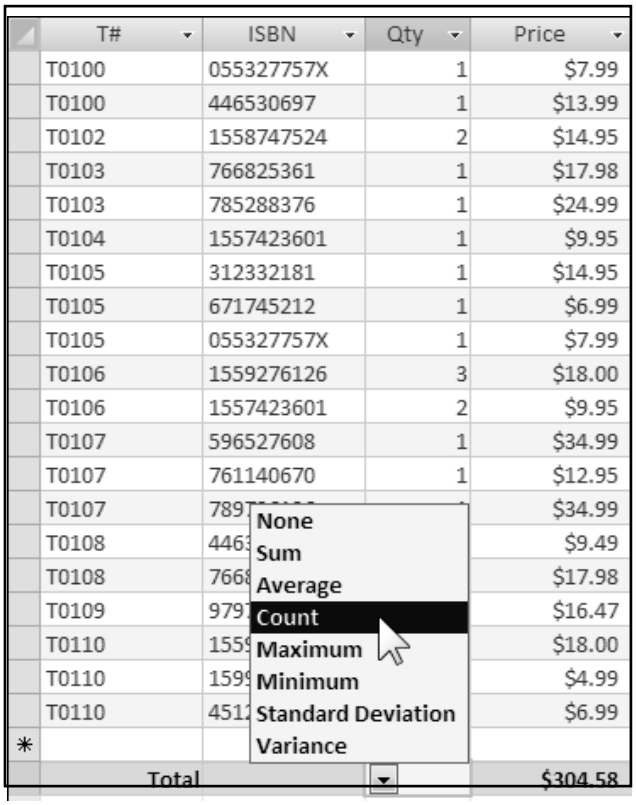
4. On the *Home* tab, in the *Records* group, click *Totals*.



The *Totals* row appears beneath the asterisk (*) row. In the Totals row, click the down arrow in the column that you want to calculate.

5. Click the Totals row in the *Qty* column. Click the down arrow and select **Count**.

6. Click the Totals row in the *Price* column. Click the down arrow and select **Sum**.



Once a totals row is created, it can never be removed. Instead, you **hide** the row. When you display the row again, Access remembers the function that you applied to each column in your datasheet and the row appears in its previous state.

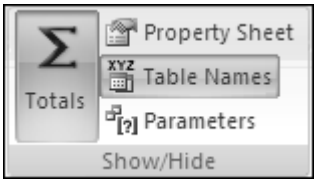
7. Note that the *Totals* button you clicked to create the totals row is active (orange). To hide a totals row, click the Totals button (it acts as a toggle).

8. Access removes the totals row.

EXERCISE - CALCULATING AGGREGATES (IN QUERIES)

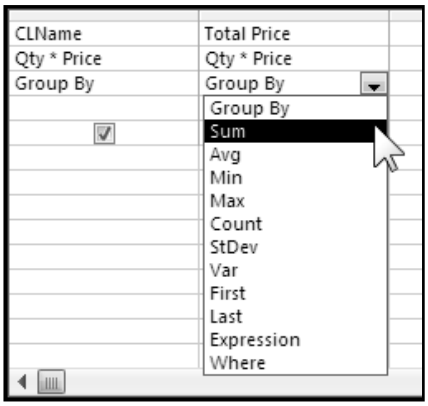
The aggregate feature for queries allows more flexibility in summarizing data.
Ana Rivera, manager of **Books4U**, would like a listing of the **total sales** to date for **each customer** and a listing of the **total sales for each transaction**.

1. Close all database objects.
2. In the ribbon on the *Create* tab in the *Other* group, click the *Query* Design button. The *Show Table* dialog box opens.
3. We have already calculated the total price paid (total sales) for each transaction detail using an *expression*. That data result is a query and is named *Qty * Price*. Click the **Queries tab** in the *Show Table* dialog box.
4. Click the *Qty * Price* query. Click **Add**. Click **Close**.
5. Double-Click the *CLName* and *Total Price* fields from the *Qty * Price* field list. The fields appear in the query grid.
6. On the Query Tools *Design* tab in the *Show/Hide* group, click the *Totals* button to add a *Total* row to the query design grid.



Remember that aggregates are calculated on **groups** of data. The default option for the total row is *Group By*. To retrieve a listing of total sales for each customer, the data must be grouped by customer, and then summed.

7. In the *Total* row of the *CLName* field, *Group by* is the correct option. Access will group the data by customer name. Keep the default settings.
8. Click the *Total* row of the *Total Price* field. The pull-down menu contains the list of aggregate options. Select ***Sum***. Toggle to *Datasheet* View to see the results.
9. Close the query. Save it as *Total Sales by Customer*.



CLName	SumOfTotal Price
Frank	$9.95
Gilles	$42.97
Hardy	$27.47
Karry	$34.99
Redding	$16.47
Singer	$21.98
Sweeny	$103.88
Victors	$46.40
Zehper	$112.83

EXERCISE - CALCULATING AGGREGATES (IN QUERIES)

10. In the ribbon on the *Create* tab in the *Other* group, click the *Query* Design button. The *Show Table* dialog box opens.

11. Click the *Qty * Price* query. Click **Add**. Click **Close**.

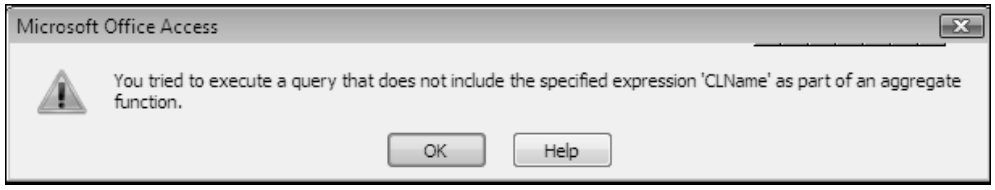
In this query, we are looking for **total sales** for **each transaction**. The data comes from the same source, however, we need to group the *transaction* data and sum the *total sales*. Include the Customer's name in this list to compare with the previous result.

12. Double-Click the *T#, CLName,* and *Total Price* fields from the *Qty * Price* field list. The fields appear in the query grid.

13. On the Query Tools *Design* tab in the *Show/Hide* group, click the *Totals* button to add a *Total* row to the query design grid.

14. In the *Total* row of the *T#* field, *Group by* is the correct option. Access will group the data by Transaction number. Keep the default settings.

15. In the *Total* row of the *CLName* field, *Group by* is the correct option. Because there is only one customer per transaction, Access will group the data by Transaction number and customer name *together*. Keep the default settings. If you do not specify the *Group by* option for customer name, Access will display the following message:


Microsoft Office Access
You tried to execute a query that does not include the specified expression 'CLName' as part of an aggregate function.
OK
Help

16. Click the *Total* row of the *Total Price* field. The pull-down menu contains the list of aggregate options. Select ***Sum***. Toggle to *Datasheet* View to see the results.

17. Close the query. Save it as *Total Sales by Transaction*.

T#	CLName	SumOfTotal
T0100	Singer	$21.98
T0101	Karry	$34.99
T0102	Zehper	$29.90
T0103	Gilles	$42.97
T0104	Frank	$9.95
T0105	Victors	$46.40
T0106	Sweeny	$73.90
T0107	Zehper	$82.93
T0108	Hardy	$27.47
T0109	Redding	$16.47
T0110	Sweeny	$29.98

FORMS

Many Uses

A form is a database object that you can use to enter, edit, or display data from a table or a query. You can use forms to control access to specific rows or fields of data. Controls can be added to a form to automate frequently performed actions.

The form is a different view of your database: forms can be designed for effective retrieval of data through automated searches; a visually attractive form is easier and more enjoyable to use; a form can also include verification controls to help prevent incorrect data from being entered.

Form Views

Access allows database users to view forms in different ways. This involves viewing a form during design, runtime, or a combination of both. The views are available on the *Format* tab in the *Views* group on the ribbon.

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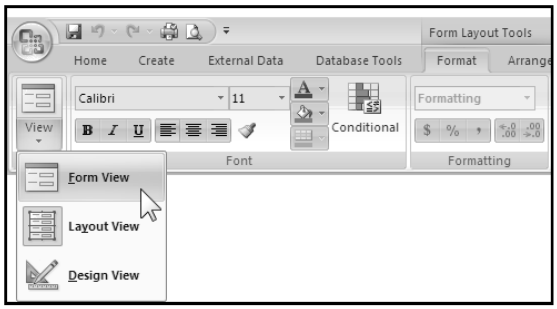


View Types

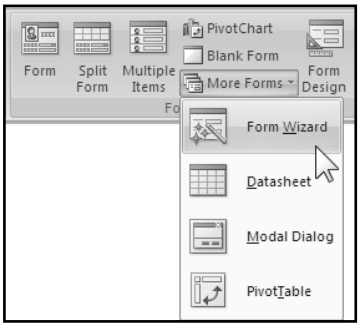
View	Description
Design	A detailed view of the structure of your form. It contains the Header, Detail, and Footer sections. A wide variety of controls, such as graphic images and labels can be added in Design view. The form is not actually running in this view, so you cannot see the underlying data while you are making design changes.
Form	The form is running in this view so you can see the underlying data on which the form is based. You can use this view to add records, edit records, or navigate through a table. Changes to the design of the form cannot be implemented in this view.
Layout	The form is running in this view so you can see the underlying data on which the form is based. You can also make changes to the form design in this view. Because you can see the data while you are modifying the form, this is a useful view for setting the size of controls or performing almost any other task that affects the appearance and usability of the form.

FORMS CREATION TOOLS

Form Creation Tools

Access 2007 offers several form creation tools that can be used interchangeably, depending on the needs of the user; the *Form Tool* creates a new form with one click; a *Split Form* shows two synchronized views for a form, with one half displaying the form using *Form* view while the other half displays data in *Datasheet* view; the *Form Wizard* guides the user through a series of dialog boxes to generate the form, offering more choices for the form layout.

In order to use the form creation tools, you must first select the table object in the Navigation pane upon which to base the new form. The form creation tools are located on the *Create* tab in the *Forms* group.



The following table describes the form creation tools. We will create forms using a number of these tools in the pages that follow.

Form Creation Tool	Description
Form	Creates a form with one click and uses all the fields in a table. The form will display in Layout view.
Split Form	Displays the form in Form view and Datasheet view simultaneously. Form view can be used to edit a record while the Datasheet view can be used to navigate to a record.
Multiple Items	Multiple records from the table are displayed in the form as a spreadsheet.
Pivot Chart	Creates a form in Pivot Chart view. This allows a three-dimensional analysis of data.
Blank Form	Creates a form from scratch. The form is developed by adding and positioning controls, including a field, on a blank form.
Form Wizard	The wizard takes the user through a series of steps to specify the layout and background themes for the form.
Form Design	Helps to create a more detailed structure of your form in Design view. With this tool, you have a wider variety of controls you can add to your form. You can also resize form sections such as the Header or Detail section, and you can edit the text box control sources without using the property sheet.

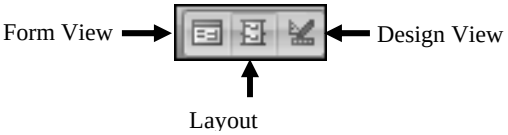
EXERCISE – CREATE A FORM (FORM TOOL)

Books4U has decided to create forms for adding and maintaining records in tables to make the task easier for employees. We will use the *Form Tool* to create a simple form for the *Employees* table.

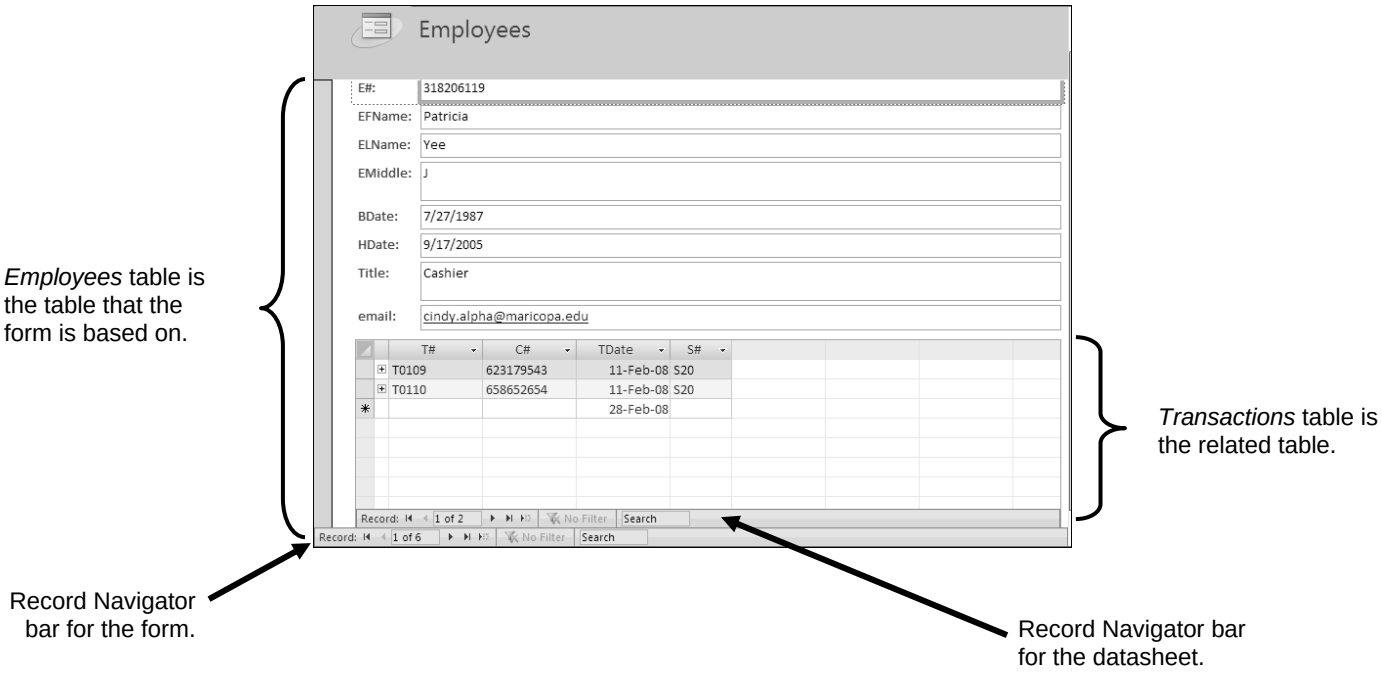
1. Left-click the *Employees* table in the *Navigation* pane to select the table.

2. In the ribbon click the *Create* tab. In the Forms group, click the *Form* button.

Access creates the form using all fields in the table in a vertical layout. The records are displayed in ***Layout View*** with the *Form Layout Tools Format* tab active. Remember the views are available on the *Format* tab in the *Views* group. You also have quick access to the form views at the right end of the *status bar* in the lower right corner of the screen.



You will recall that the *Employees* table is related to the *Transactions* table in a one-to-many relationship. Access adds the datasheet to the form that is based on the related table. You can delete the datasheet from the form if you do not need it; in *Layout view*, click anywhere in the *datasheet* and press the *Delete* key. Do not delete the related datasheet.



EXERCISE – CREATE A FORM (FORM TOOL)

3. Click the *Form View* button on the *Status bar* in the lower right corner of the screen. You can browse through the data of the Employees table in this view as in *Layout* view and, you can make modifications to existing data or add new data in *Form* view.

4. Use the *Record Navigator* bar at the bottom of the form to advance the *Employee* records. Note that the datasheet will show the related *Transactions* for each employee. Go to a **new** (blank) *Employee* record by clicking the *New Record* button on the *Employees* record navigator bar.

5. Click the *E#* textbox. Enter a new record using the following data. ***Tab*** to advance to the next field.

E#	999-999-999 (don't include dashes)
EFName	Your first name
ELName	Your last name
EMiddle	Middle initial
BDate	Your birth date
HDate	Today's date
Title	Salesperson
Email	Your email address

6. Click the first new record of T# in the datasheet. Enter a new related record using the following data. ***Tab*** to advance to the next field. Press the Enter key to accept the changes.

T#	T0111
C#	699-74-5211 (don't include dashes)
TDate	Today (autofilled)
S#	S30

7. Close the form. Click Yes to save. Name the form ***Employee Form***. Click OK.

8. In the Navigation pane, double-click the *Employees* table to open. Note the new record that was added through the form.

9. In the Navigation pane, double-click the *Transactions* table to open. Note the new record that was added through the form datasheet.

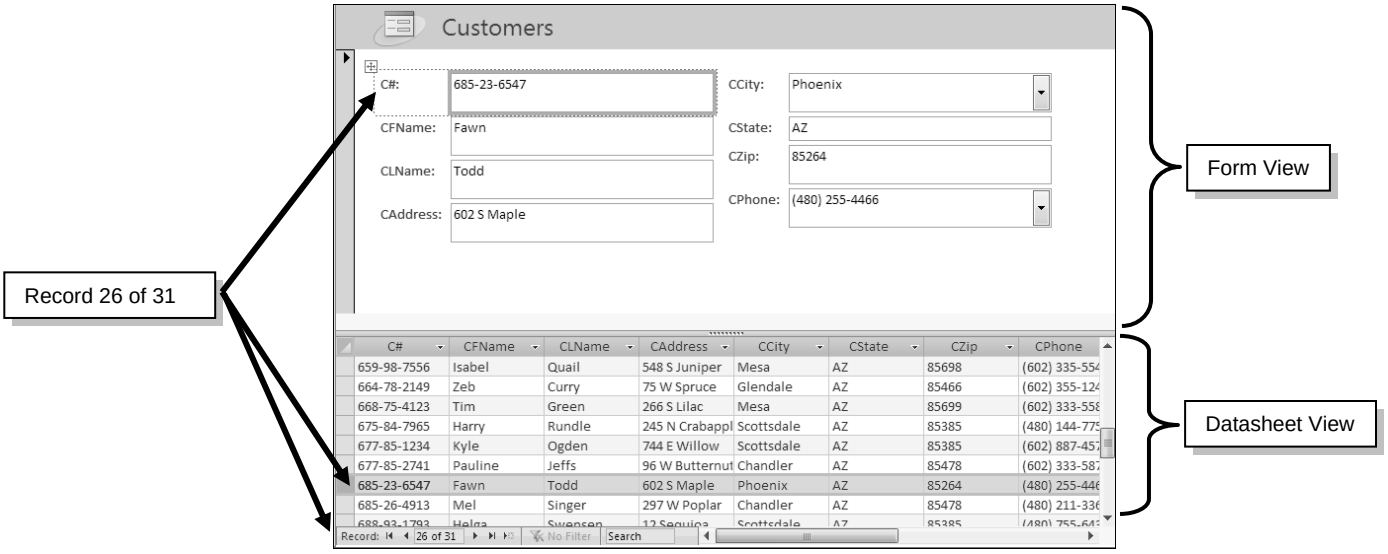
10. Reopen the *Employee Form* by double-clicking it in the Navigation pane under *Forms* objects.

11. Click the last record button on the form Record Navigation bar. Close all objects

EXERCISE – CREATE A FORM (SPLIT FORM TOOL)

A split-form is a new feature in Access 2007 that gives two views of the **same** data at the same time; a *Form* view and a *Datasheet* view. The two views are connected to the same data source and synchronized at all times. Selecting a field in one part of the form selects the same field in the other part of the form. For example, use the datasheet to quickly locate a record, and then use the form portion to view or edit the record.

1. Left-click the *Customers* table in the *Navigation* pane to select the table.
2. In the ribbon click the *Create* tab. In the Forms group, click the *Split Form* button.


Customers
C#: 685-23-6547
CFName: Fawn
CLName: Todd
CAddress: 602 S Maple
CCity: Phoenix
CState: AZ
CZip: 85264
CPhone: (480) 255-4466
Form View
Record 26 of 31
Datasheet View
C# CFName CLName CAddress CCity CState CZip CPhone
659-98-7556 Isabel Quail 548 S Juniper Mesa AZ 85698
664-78-2149 Zeb Curry 75 W Spruce Glendale AZ 85466
668-75-4123 Tim Green 266 S Lilac Mesa AZ 85699
675-84-7965 Harry Rundle 245 N Crabappl Scottsdale AZ 85385
677-85-1234 Kyle Ogden 744 E Willow Scottsdale AZ 85385
677-85-2741 Pauline Jeffs 96 W Butternut Chandler AZ 85478
685-23-6547 Fawn Todd 602 S Maple Phoenix AZ 85264
685-26-4913 Mel Singer 297 W Poplar Chandler AZ 85478
Record: 26 of 31
No Filter
Search

Access creates the form and displays it in *Layout* view. Recall that in *Layout* view, you can make **design** changes to the *Form* while it is displaying data. With a split form, you can also make **data** changes to the *Datasheet* that will reflect back to the *Form.* (***Allow Edits*** *must be set in the Split Form property sheet – press F4*)

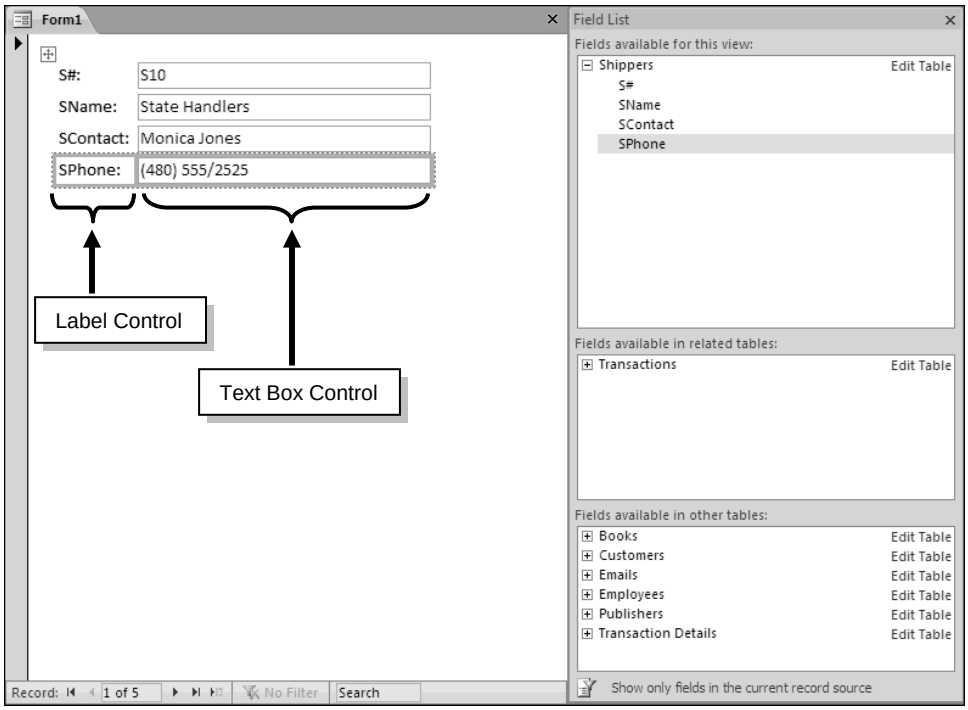
3. Click the *Layout View* button on the *Status bar* in the lower right corner of the screen.
4. Locate and select the record for Isabel Quail in the *Datasheet*. The record is displayed in the form above.
5. Change Isabel's first name to Connie. Press the *Enter* key. The changes sync to the form above.
6. On the form, click the *C#* field. Left-click the right orange border of the textbox for *C#* and while holding down the mouse button, drag the mouse to the left to shorten the textbox. Repeat the steps for the *CCity* field.

7. Close the form. Click **Yes** to save the changes. **Name** the form *Customers Split Form*.

EXERCISE – CREATE A FORM (BLANK FORM TOOL)

The *Blank Form* tool is a quick way to build a form, especially if you plan to use only a few fields.

1. In the ribbon click the *Create* tab. In the Forms group, click the *Blank Form* button. Access opens a blank form in ***Layout*** view and displays the *Field List* pane. In the *Field List* pane, click the plus sign (+) next to the *Shippers* table.



2. To add a field to the form, double-click the *S#* field or click and drag it to the form. To add all remaining fields from *Shippers* at once, hold down the CTRL key and click each field. Drag them to the form.

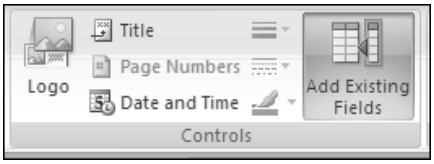
As with the *Form* and *Split Form* tools, each form created is a series of objects called ***controls***. Each field from the table has a *Label Control* and a *Text Box Control*. The label control contains the field name. The text box control is the *field placeholder* where data is retrieved from the database and can be entered or edited. The controls can be moved, resized, formatted, or deleted from the form.

A form's style can be modified after the form has been created by changing the color theme and fonts. Tools in the *Controls* group on the *Format* tab can be used to add a logo, title, page numbers, or the date and time to a form. We'll customize the form next.

EXERCISE – CREATE A FORM (BLANK FORM TOOL)

3. Close the *Field List* task pane at the right side of the work area by clicking the Close button at the top right corner of the pane. The form is in ***Layout*** view.

4. On the *Format* tab, in the *Controls* group, there are several control tools that we can use to customize the form. Click the *Logo* button.

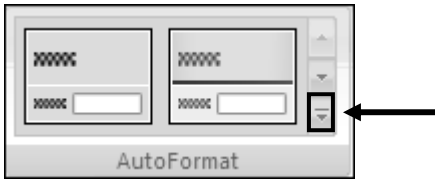


5. At the *Insert Picture* dialog box, navigate to the *Access 07 Class* folder on the Desktop. Double-click ***MCCCDlogo***.

6. Click the *Title* button in the *Controls* group. Click the *Title* control to rename it ***Books4U Shippers Form***. Press *Enter* to commit the change.

7. Click the *Title* control. Position the mouse pointer on the right edge until the cursor changes to a left/right pointing arrow, click and drag the right border to accommodate the title to display on one line. To reposition the control, click inside the control and drag it to the new position.

8. To change the form's ***style***, click the *More* button located at the bottom of the vertical scroll bar in the *AutoFormat* group in the *Form Layout Tools Format* tab. The drop-down *style gallery* is displayed.



9. Click the *Office* style button (1st column, 4th row) at the drop down list.

10. Click the *Title* control object and drag it to reposition it as shown.

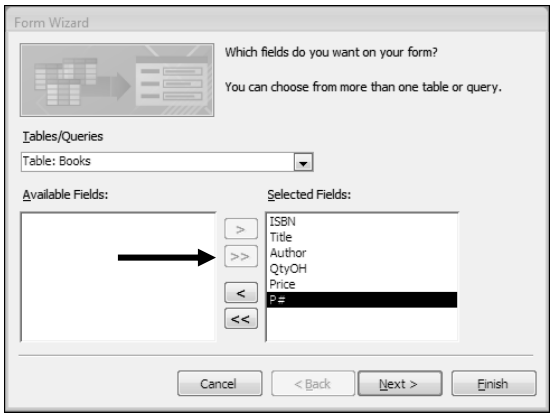
11. Click the *Logo* image. Drag the right bottom borders to resize the image. Click in a blank area of the form to deselect the logo control object.

12. Click the **Save** button on the *Quick Access Toolbar*. Name the form ***Shippers Form***. Close the form.

EXERCISE – CREATE A FORM (FORM WIZARD)

The Form Wizard provides more choices for the form's design. The user is guided through a series of dialog boxes to generate the form.

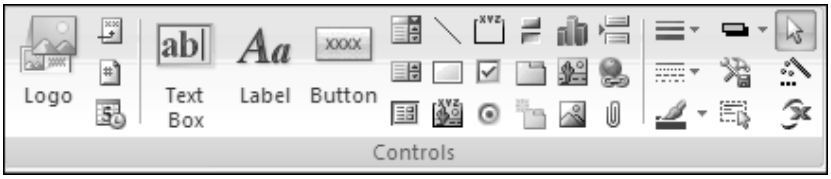
1. On the *Create* tab in the *Forms* group, click the *More Forms* drop-down button and click *Form Wizard*.
2. In the *Form Wizard* dialog box, click the down arrow to the right of the *Tables/Queries* list box and click the *Books* table to select it.



3. Click the *Add All Fields* button to move all of the fields in the *Available Fields* list box to the *Selected Fields* list box. Click **Next**.

4. With *Columnar* already selected as the form layout, click **Next**.
5. Using the scroll bar, preview each style's colors and backgrounds in the preview window. Click *Flow* to select it, and then click **Next**.
6. Name the form ***Books Form***. Click **Finish**.

Switching to *Design* view will add a wider variety of controls to the form. On the *Design* tab in the *Controls* group, the number of available controls is displayed. We will use several of these controls to modify our *Books* form.



EXERCISE – CREATE A FORM (ADDING CONTROLS)

The ***Books Form*** was created by Access and opened in *Layout* view. We will switch to *Design* view to take advantage of additional controls.

1. Click the *Design View* button on the *Status bar* in the lower right corner of the screen.

The ***Books*** form is divided into three sections; *Form Header*, *Detail*, and *Form Footer*. The *Form Header* section contains the title which is the name of our form. We can also add a logo and a date to the header section.

2. Expand the *Form Header* section. Roll the cursor to the area between the *Form Header* and *Detail* sections. When the cursor changes to a double-arrow, left-click and drag the line down to expand the header section.

3. Click the title. Rename the title ***Books4U Books***. Click a blank area of the form to deselect the title. Click the title again to display the control borders. Resize the title control by dragging the left and bottom borders until the title is displayed on one line. Use the *Font* group to change the **type**, **bold** and **size** font properties. It is not necessary to highlight the text, only to select the title control box.

4. Reposition the title on the form. Position the mouse pointer over the control until the pointer turns into a four-headed arrow. Click and drag the control to the center of the header section. Click a blank area of the form to deselect title control.

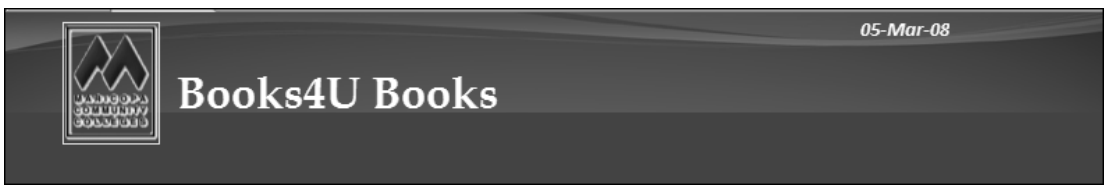
5. To add the logo, click the *Logo* button in the *Controls* group on the ribbon. At the *Insert Picture* dialog box, navigate to the *Access 07 Class* folder on the Desktop. Double-click ***MCCCDlogo***. Drag the right bottom borders to resize the image. Click a blank area of the form to deselect the logo control.

6. To add a date to the form, click the *Date&Time* button in the *Controls* group on the ribbon.

7. In the *Date and Time* dialog box, check the box to include date; uncheck the box to include time. Click the radio button of the second date format. Click **OK**.

8. Access places the date in the upper right corner of the form. Click the date control and use the *Font* group to change the **color** and **bold** font properties. Click a blank area of the form to deselect the date control.

9. Click the *Form View* button on the *Status bar* in the lower right corner of the screen.



EXERCISE – CREATE A FORM (ADDING CONTROLS)

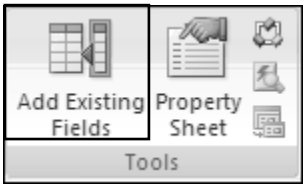
10. In *Form* view, notice that there is a large space between the field names and the data of the *Detail* section. Click the *Design View* button on the *Status bar* in the lower right corner of the screen.

11. While holding down the **Shift** key, click each of the *Label* controls until they are all selected. In the *Font* group on the ribbon, click the *Align Text Right* button. Click to *bold* the text.

12. Narrow the space between the fields. *(If you select the label control of the field, the text box control will be selected automatically at the same time.)*

13. While holding down the **Shift** key, click ISBN, Title, Author, and P# *Label* controls to select them. Notice a broken border around the corresponding *Text Box* controls. Position the cursor on the bottom right corner of any of the selected *Label* controls until the cursor changes to a diagonal double-arrow. Left-click and drag the mouse straight up (1/4 inch). All *Label* and *Text Box* controls are resized.

14. Place the *Publisher's name* below the *P#*. The publisher's name is in the *Publishers* table. To display the *Field List* pane, click the *Add Existing Fields* button in the *Tools* group on the ribbon. The *Field List* pane opens.



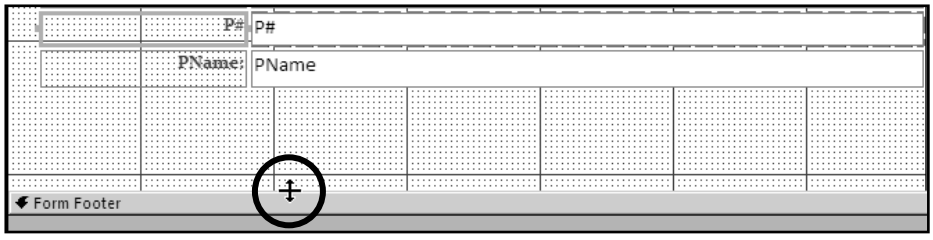
15. In the middle section of the *Field List* pane (*Fields available in related tables*), click the plus sign (+) next to the *Publishers* table. The fields from the *Publishers* table are now visible.

16. Double-click or click and drag the *Pname* field to the form. The *Label* and *Text Box* controls appear on the form. Close the *Field List* pane.

17. Resize each control by clicking the right and bottom borders of the control and dragging the borders to match the controls already on the form. Reposition the controls if necessary.

18. Click the *Form View* button on the *Status bar* in the lower right corner of the screen to view the changes. Click back to *Design View*.

Add a reminder message at the bottom of the form. To do this, we need a *Label* control. Before we add the control, expand the *Detail* section of the form. Roll the cursor to the area between the *Detail* and *Form Footer* sections. When the cursor changes to a double-arrow, left-click and drag the line down to expand the detail section.



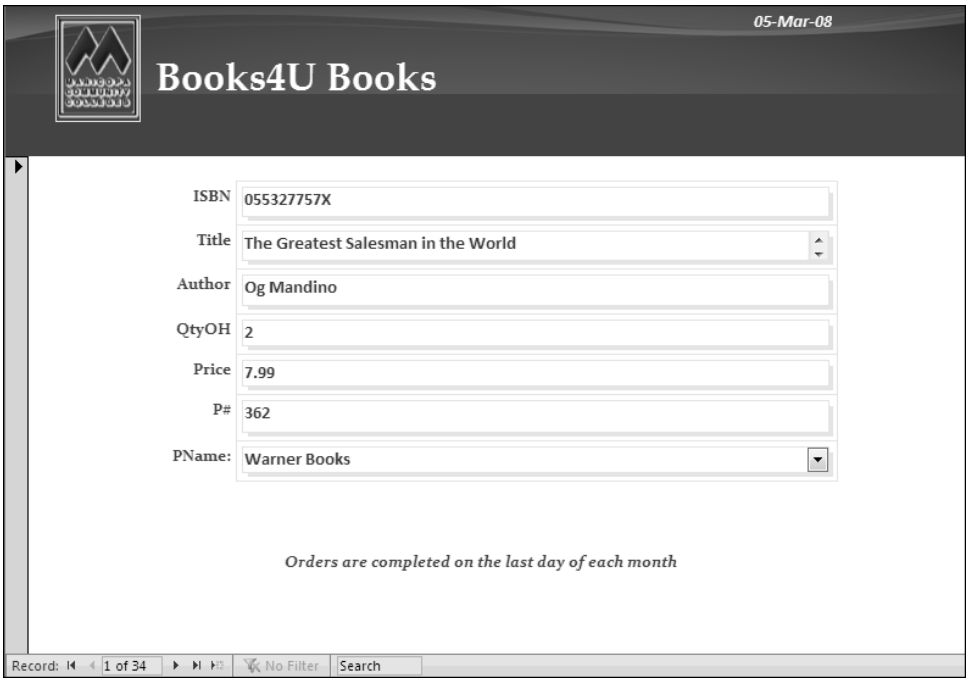
EXERCISE – CREATE A FORM (ADDING CONTROLS)

19. To add a *Label* control, click the *Label* button in the *Controls* group on the ribbon. If you do not see the *Controls* group, make sure you are in *Design View*.

20. Position the mouse pointer below the *Pname* controls. The mouse pointer changes to ***+A***. Click and drag the mouse pointer to create a control that matches the size of the *Pname Text Box* control. Release the mouse. The *Label* control is created and a blinking cursor is positioned to the top left of the control.

21. Type ***Orders are completed on the last day of each month*** in the *Label* control. Click a blank area of the form to deselect the label control.

22. Click the label control again to activate the *Font* group to change the **italic** and **bold** font properties. Align the control in the center of the form. Click the *Form View* button on the *Status bar* in the lower right corner of the screen to view the changes.



23. Click the *New Record* button on the *Record Navigator* bar. Access creates a blank record. Enter information for a fictitious book with you as the author. Type 100 for *P#*. As you tab to *Pname*, you will notice that Access ***auto fills*** the data from the database. (one-to-many relationship between *Books* and *Publishers*)

24. **Save** the form. **Close** the form.

NOTES

SUBFORMS

Form tool
Sub datasheet

When working with related data tables, you often need to view data from more than one table or query on the same form. For example, customer information and all data for each order placed by the customer is on the same form. You will recall that Access 2007 creates a similar display with the *Form* tool; if the form data has a one-to-many relationship with another table/query in the database, Access adds a *datasheet* to the form that is based on the related table/query.

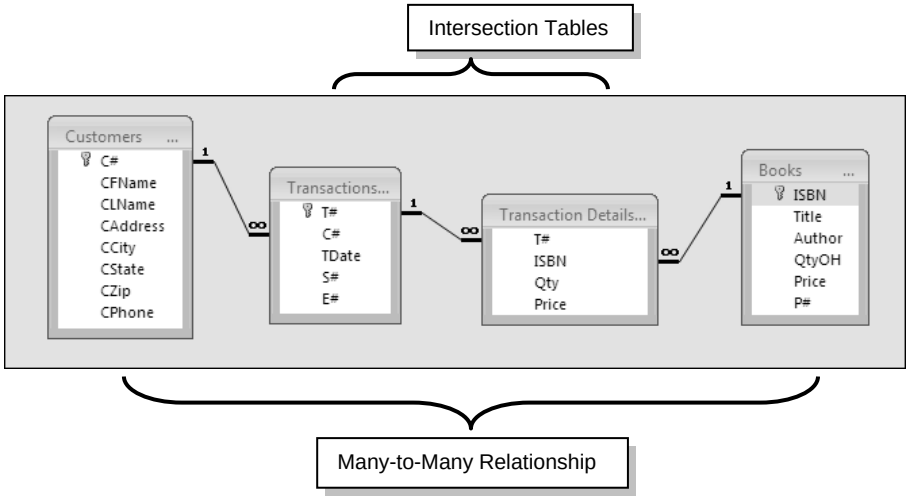
Sub-Forms

A *subform* is a form that is inserted in another form called the *main* or *primary* form. In a one-to-many relationship, the main form shows the "one" side of the relationship, while the subform displays the "many" side. Access creates two forms; one for the main form, and one for the subform.

Forms are linked

The main form and subform are linked so that the subform displays only records that are related to the current record in the main form. For example, when the main form displays employee information, the subform displays only the transactions for that employee.

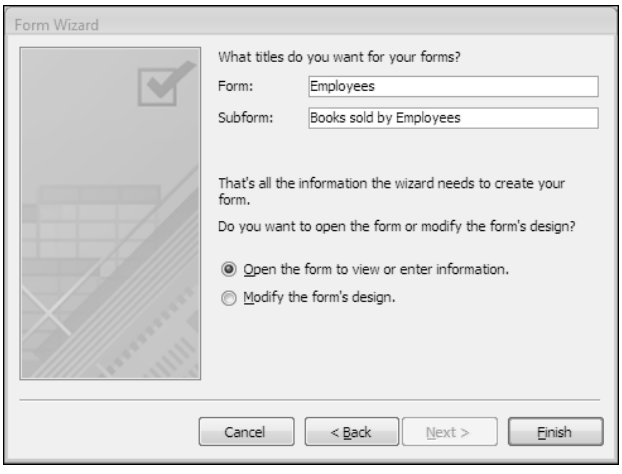
To create the subform, all relationships must be established first. This allows Access to automatically create the links between the main form and subform. When identifying the tables that will be used in the main form/subform, there does not need to be a *direct* one-to-many relationship between the tables. Access will create the subform with tables that have a many-to-many relationship, utilizing the modified design of one-to-many relationships that were created to resolve the many-to-many relationship issue. For example, a customer can purchase many book titles and a book title can be purchased by many customers. In creating the main form/subform, Access utilizes the intersection table used to form the one-to-many relationships.



EXERCISE – SUBFORMS (FORM WIZARD)

Books4U requires a form to display a list of books that each employee has sold. The Employee's ID, last name, and title should be included. Book information includes ISBN, book title, purchase price, and purchase date.

1. Click the *Create* tab. In the Forms group, click *More Forms* and then click *Form Wizard*.
2. On the first page of the wizard, identify the tables and fields required to build this form. In the *Tables/Queries* drop-down list, select the *Employees* table.
3. Double-click *E#*, *ELName*, and *Title*.
4. On the same page of the wizard, in the *Tables/Queries* drop-down list, select the *Books* table.
5. Double-click the *ISBN*, *Title*, and *Price* fields. Click **Next**.
6. On the second page the wizard asks how you want to view your data. We want to view each employee's list of books. Select ***by Employees***. The wizard displays a small diagram of the form layout. The box in the lower portion represents the subform.
7. At the bottom of the page select the *Form with subform(s)* option. Click **Next**.
8. The third page of the wizard asks you to choose a layout for the subform; *Tabular* or *Datasheet*. Both layout styles arrange the subform data in rows and columns. Although the tabular subform allows you to add color, graphics and other formatting elements, choose the ***Datasheet*** layout. Click **Next**.
9. Choose the style for the form next. If the form has a Tabular layout, the formatting style will also be used for the subform. As you click through the choices on the right, the wizard previews the style to the left. Make a selection. Click **Next.**
10. On the last page of the wizard, name the forms as shown below. Click **Finish**.


Form Wizard
What titles do you want for your forms?
Form:
Employees
Subform:
Books sold by Employees
That's all the information the wizard needs to create your form.
Do you want to open the form or modify the form's design?
Open the form to view or enter information.
Modify the form's design.
Cancel
< Back
Next >
Finish

EXERCISE – SUBFORMS (ENHANCE THE APPEARANCE)

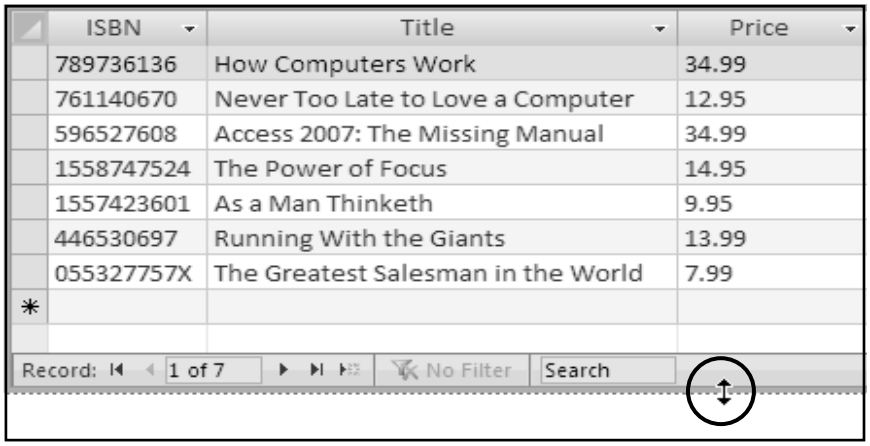
11. The form opens in *Form* view. To increase your viewing area of the *Employee* form, click the shutter bar on the *Navigation* pane.

As you click the *record navigation* bar of the main form (*Employees*), the books sold by each employee is displayed in the subform. In some cases, the subform columns do not accommodate the data. The subform also needs to be larger to include more records.

12. Click the *Layout View* button on the *Status bar* in the lower right corner of the screen.

13. Resize the columns of the subform to accommodate the data. Click the record navigation bar of the main form to ensure that the column sizes will contain all column data.

14. Employee record #6 has more records than those displayed on the current form. To expand the subform, click the subform to select it. An orange border appears around the subform. Position the mouse pointer on the bottom edge of the subform until the pointer changes to a double arrow, drag the border down, and release the mouse. Click in a blank area of the form to deselect the subform.



15. Click the record navigation bar of the main form (*Employees*) to locate the **fifth** record. The subform shows that Leadership was sold twice by Bullock. To get more information about the sale, we need to add the purchase date.

The purchase date was on the list of required fields to be placed on the *Employee* form. However, the purchase date (*TDate*) is in the *Transactions* table. If we had selected TDate while creating the form, it would have required three tables and the form wizard would have created a form with two subforms. We need only **add** *TDate* to the current subform. To accomplish this task, we need the *Field List* pane.

EXERCISE – SUBFORMS (ENHANCING THE APPEARANCE)

16. Click the subform to select it.

17. In the *Controls* group of the *Format* tab, click the *Add Existing Fields* button.

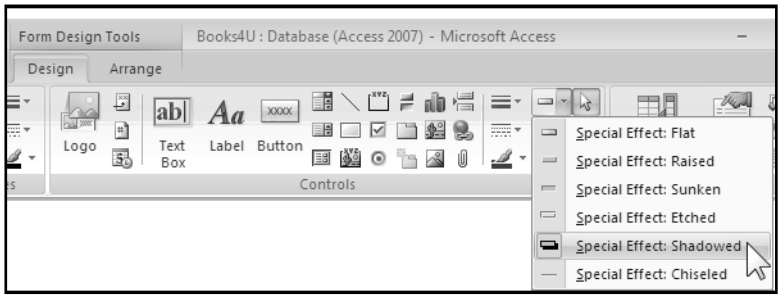
18. If the tables are not visible, click *Show all tables* at the bottom of the fields list pane.

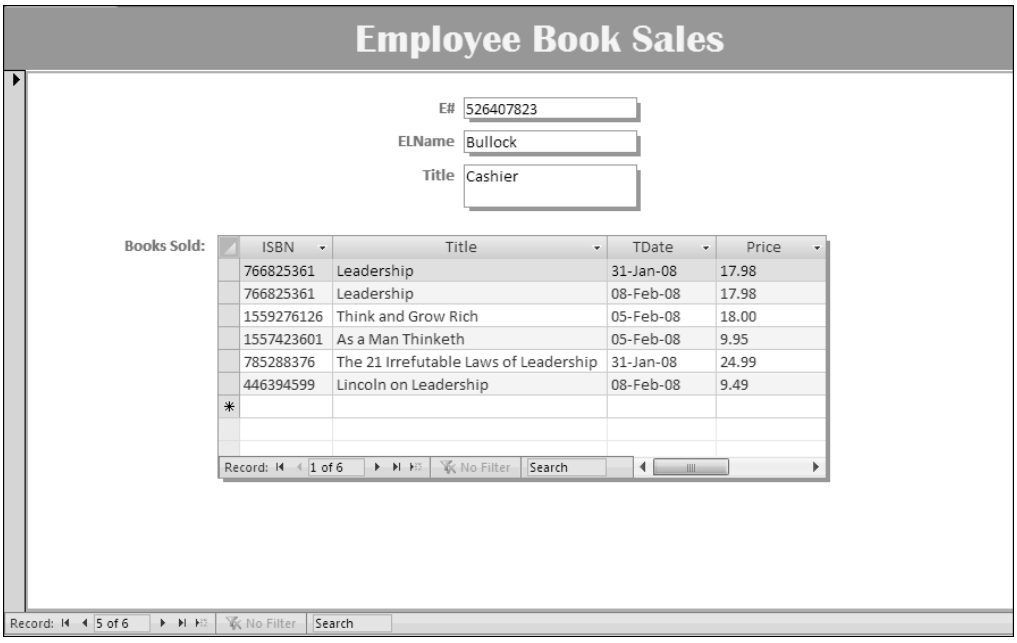
19. In the *Field List* pane, click the plus sign (+) next to the *Transactions* table. Double-click the *TDate* field to add it to the subform. **Close** the field list pane.

To modify the form further (logo, format controls, etc.) click to *Design* view. On the *Design* tab in the *Controls* group, a larger number of available controls are displayed.

20. Change the effect of the **text box controls** that display employee information. Click the *E#* text box control. While holding down the Shift key, click the *ELName* and *Title* text box controls to select them.

21. In the *Controls* group, click the ***Special Effects*** button. At the pull-down menu, click ***shadowed***. Click to *Form* view. If there is no change using the effects, you may choose a different style. In *Design* view, on the *Arrange* tab, click *AutoFormat*.




Employee Book Sales
E# 526407823
ELName Bullock
Title Cashier
Books Sold:
ISBN | Title | TDate | Price
766825361 | Leadership | 31-Jan-08 | 17.98
766825361 | Leadership | 08-Feb-08 | 17.98
1559276126 | Think and Grow Rich | 05-Feb-08 | 18.00
1557423601 | As a Man Thinketh | 05-Feb-08 | 9.95
785288376 | The 21 Irrefutable Laws of Leadership | 31-Jan-08 | 24.99
446394599 | Lincoln on Leadership | 08-Feb-08 | 9.49
Record: 1 of 6
No Filter
Search
Record: 5 of 6
No Filter
Search

CONTROL LAYOUTS

Arranging the Display

When forms are created, Access arranges the *label* and *text box* controls into one of two *control layouts*: **Tabular** and **Stacked**. Control layouts are guides that align the controls horizontally and vertically to give your form a uniform appearance. You can have multiple control layouts of either type on a form.

Tabular Layouts

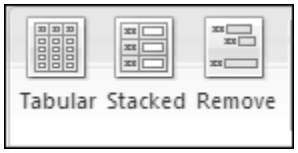
In tabular layouts, controls are arranged in rows and columns like a spreadsheet, with labels across the top. Tabular control layouts always span two sections of a form; whichever section the controls are in, the labels are in the section above.

Stacked Layouts

In stacked layouts, controls are arranged vertically with a label to the left of each control. Stacked layouts are always contained within a single form section. Access automatically creates stacked control layouts when you create a new form by clicking *Form* in the *Forms* group on the *Create* tab, or by clicking *Blank Form* in the *Forms* group on the *Create* tab and then dragging a field from the *Field List* pane to the form.

Arranging the Display

On an existing form, you can create a new control layout by first selecting the control and then clicking either the tabular or stacked buttons in the *Control Layout* group on the *Arrange* tab.



Switching Control Layouts

Control layouts can be switched from tabular to stacked, or from stacked to tabular. Select all of the controls of the layout. On the *Arrange* tab, in the *Control Layout* group, click the layout type you want.

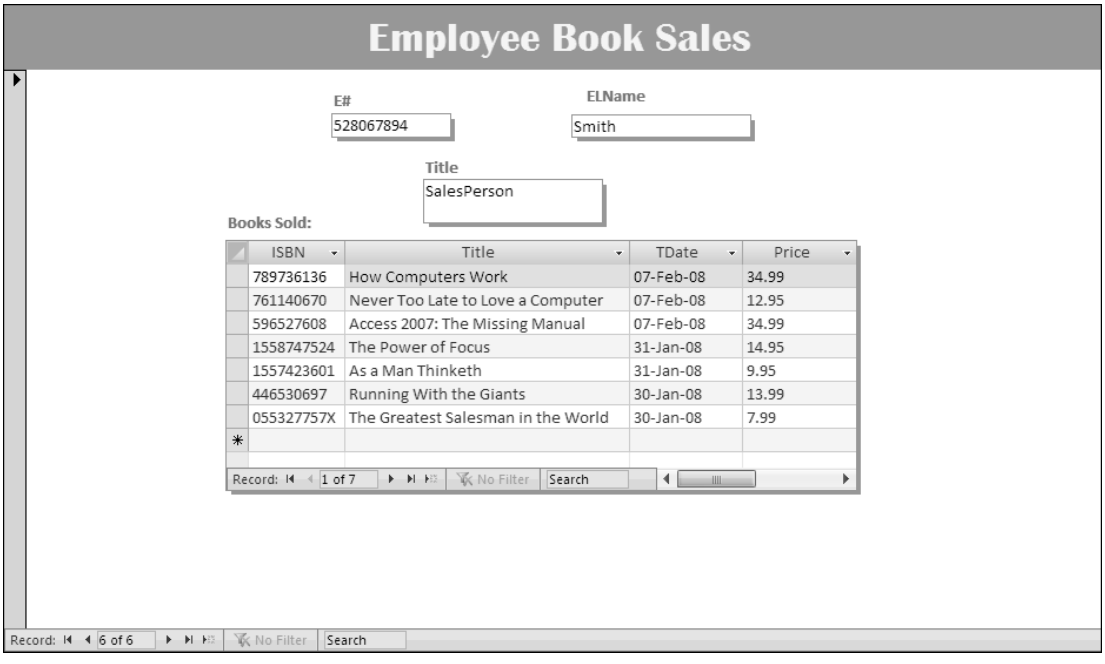
Removing Controls from Layouts

Removing a control from a control layout allows you to place it anywhere on the form without affecting the positioning of any other controls. Once you select the control(s) you want to remove from the layout, click Remove in the *Control Layout* group on the *Arrange* tab.

EXERCISE – REMOVE CONTROLS FROM A CONTROL LAYOUT

On the Employee subform, the employee information is contained within a stacked control layout. We cannot move one control without moving the entire group. To enhance the appearance of the form, modify the position of the employee data on the form.

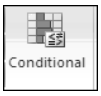
1. Click the *Layout View* button on the *Status bar* in the lower right corner of the screen.
2. Select the three text box controls of employee data. While holding down the shift key, click the *E#*, *ELName*, and *Title* text box controls. Notice that the label controls are also selected.
3. On the *Arrange* tab, in the *Control Layout* group, click *Remove*. (*or you can right-click on any of the selected controls, point to Layout, and click Remove*) The orange layout selectors appear for each control.
4. Click on any blank area of the form to deselect the controls.
5. All label and text box controls can move independently. Reposition the controls on the form.
6. **Save** the form. **Close** the form.



EXERCISE – CONDITIONAL FORMATTING

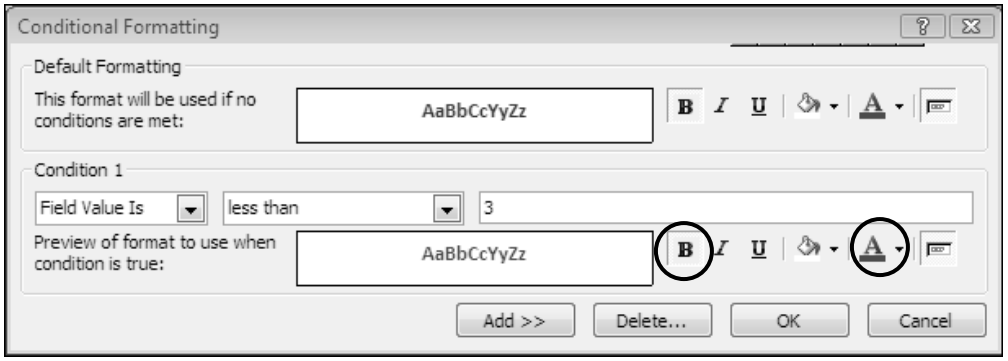
Using the *conditional formatting* feature, you can set formatting options for a control based on a condition. The conditions can be based on field values falling within a range or based on expressions.

1. Open the *Books Form*.
2. Click the *Layout View* button on the *Status bar* in the lower right corner of the screen.
3. Select the *QtyOH* text box control.
4. On the *Format* tab, in the *Font* group, click *Conditional*.



5. In the lower portion of the *Conditional Formatting* dialog box, keep the default settings for the first text box (***Field Value Is***). In the second text box use the pull-down and select ***less than***. In the third text box, type the number ***3***. Apply the **Bold** font property. Use the pull-down to select the **red** text color.

   The condition states that if the value of the *QtyOH* field is less than 3, display the text in bold red color. This will alert the user that the book needs to be reordered. Click **OK**.



6. Click through the records on the record indicator bar to identify the books that need to be reordered.
7. **Save** the form. **Close** the form.

NOTES

REPORTS

Summarizing Data

When making decisions, we can summarize the data that is viewed and manipulated on forms by generating reports. Like forms, Access 2007 offers several types of reports.

Record Source

A report contains information that is pulled from tables or queries, as well as information that is stored with the report design, such as labels, headings, and graphics. The tables or queries that provide the underlying data are the report's record source. If the fields that you want to include all exist in a single table, use that table as the record source. If the fields are contained in more than one table, use one or more queries as the record source. Those queries may already exist in your database, or you may need to create new queries specifically to fit the needs of your report.

Report Views

Access provides several views to edit and modify reports. *Design*, *Report*, and *Layout* views operate the same as they do with Access forms. *Design* view displays the detailed structure of your form. While you can modify the report sections and controls, you cannot see the data. In *Report* view, the data is displayed but changes to the design of the report cannot be implemented. *Layout* view allows you to view the data and make changes to the report design. A forth view, *Print Preview*, displays the appearance of your report when printed on paper. In this view, you can set report page layouts before printing the report.

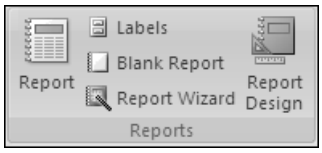
Report Creation Tools

Report Creation Tool	Description
Report	Creates a report that uses all the fields in a table or query. The report will be displayed in Layout view.
Blank Report	Aids in the creation of a report from scratch. The report is developed by adding and positioning controls of your choice.
Report Wizard	The wizard takes the user through a series of steps to specify the layout and background themes of the report. It offers options for grouping and sorting data. It also helps you analyze data from one or more tables by providing options for summarizing data using aggregate functions.
Report Design	Helps to create a more detailed structure of your form in Design view. With this tool, you have a wider range of controls you can add to your report. You can also resize report sections and edit text box control sources.

EXERCISE – CREATE A REPORT (REPORT TOOL)

The report tool generates a report immediately without prompting you for information. ***Books4U*** requires a simple report showing the total price for each transaction detail. You have previously created a query to capture all required data.

1. In the Navigation pane, click the *Qty*Price* query to select it as the record source for your report.



2. On the *Create* tab, in the *Reports* group, click ***Report***. Access builds the report and displays it in *Layout* view.

3. **Preview** the report. Click *Print Preview* on the *Quick Access Tool* bar or click the *Office* button roll the mouse over the *print* option and click *print preview*.

4. On the *Print Preview* tab, in the *Zoom* group, click Zoom. Zoom to 75%. The report data spills onto another page. Use the page navigation bar at the bottom of the screen.

   Access used the name of the query to title the report. Date, time, and page numbers are also provided as well as a calculated sum of the Total Price field. We will modify the report by changing the title and reducing the spacing between the fields.

5. **Close** print preview. The report is now in *Layout* view. **Save** and name the report *Qty * Price Report*.

6. **Resize** the columns of the report to better accommodate the data. Click one of the T# text box controls. A dotted border outlines the column. Position the mouse pointer on the right orange border until the pointer changes to a double arrow. Click and drag the mouse pointer to reduce the length of the column. Repeat for the other columns on the report.

7. Click the title. Add the word, **Report**. Center the report on the page.

8. Delete the time.

9. Preview the report.

10. **Save** the report. **Close** the report.

Qty * Price Report 20-Mar-08

T#	CLName	ISBN	Qty	Price	Total Price
T0100	Singer	055327757X	1	$7.99	$7.99
T0100	Singer	446530697	1	$13.99	$13.99
T0102	Zehper	1558747524	2	$14.95	$29.90
T0103	Gilles	766825361	1	$17.98	$17.98
T0103	Gilles	785288376	1	$24.99	$24.99
T0104	Frank	1557423601	1	$9.95	$9.95
T0105	Victors	312332181	1	$14.95	$14.95
T0105	Victors	671745212	1	$6.99	$6.99
T0105	Victors	055327757X	1	$7.99	$7.99
T0106	Sweeny	1559276126	3	$18.00	$54.00
T0106	Sweeny	1557423601	2	$9.95	$19.90
T0107	Zehper	596527608	1	$34.99	$34.99
T0107	Zehper	761140670	1	$12.95	$12.95
T0107	Zehper	789736136	1	$34.99	$34.99
T0108	Hardy	446394599	1	$9.49	$9.49
T0108	Hardy	766825361	1	$17.98	$17.98
T0109	Redding	979738504	1	$16.47	$16.47
T0110	Sweeny	1559276126	1	$18.00	$18.00
T0110	Sweeny	1599869802	1	$4.99	$4.99
T0110	Sweeny	451205367	1	$6.99	$6.99
					$365.48

GROUP REPORTS

Categorizing Data

Information is often easier to understand when it is divided into groups. For example, a report that groups *sales by city* can highlight areas that may need more of a company's advertising dollars. Adding totals for each group in the report will also help with data analysis. A basic grouped report can be created by using the *Report Wizard*.

Groups

A group is a collection of records, plus any introductory and summary information displayed with the records. A group includes a group header, possible nested groups, detail records, and a group footer. When you group a report based on a field, Access creates a group header section for that record. Group headers are matched with group footers. When a calculation is performed for a field, the calculation is performed for each of the groups and the result is displayed in the group footer.

Report Sections

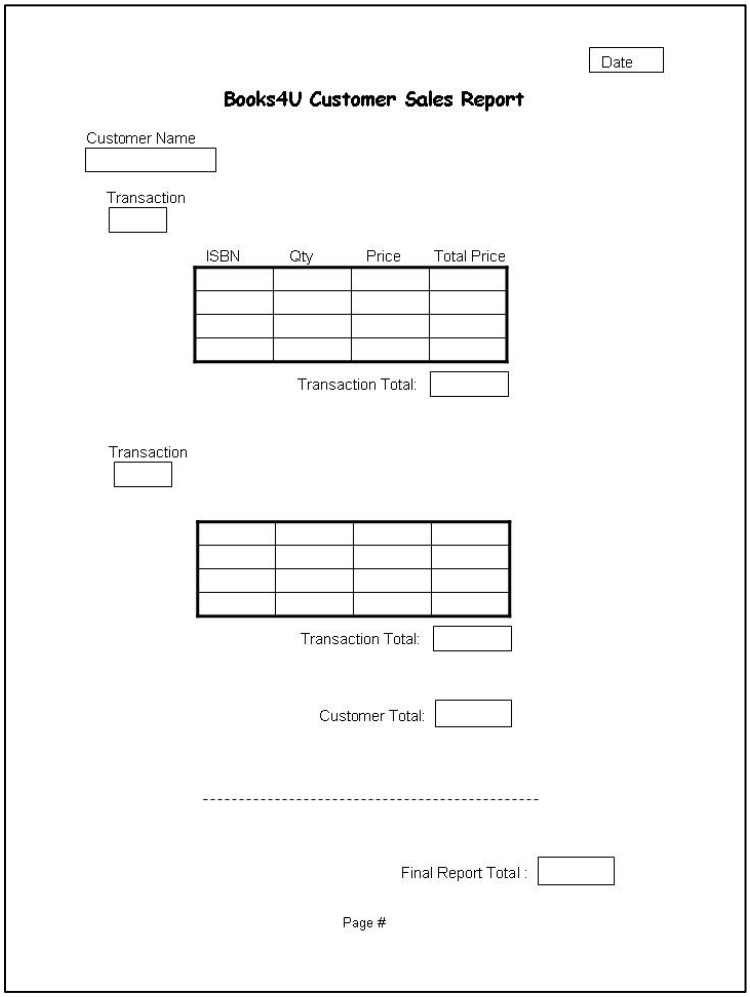
To create useful reports, placement of controls in a header, detail, or footer section determines how Access calculates results. The following describes each section type.

Section	Description
Report Header	Printed once at the beginning of the report. Usually includes logo, title, and date. This header prints before the page header. When a calculated control is placed here, the value is calculated for the entire report.
Page Header	Printed at the top of every page.
Group Header	Printed at the beginning of each new group of records. Usually the group name is placed here. When a calculated control is placed here, the value is calculated for the current group.
Detail	Printed once for every row in the record source. Controls that make up the main body of the report are placed here.
Group Footer	Printed at the end of each group of records. Use controls to print summary information for the group here.
Page Footer	Printed at the end of every page. Print page numbers here.
Report Footer	Printed once at the end of the report. Print report totals or other summary information for the entire report.

EXERCISE – CREATE A GROUP REPORT (REPORT WIZARD)

The *Report Wizard* allows you to create a more complex report that includes several layers of data in several sections. You can also add aggregate totals to different sections of the report.

Books4U requires a printed report of all *customer purchases*. Ana Rivera, manager, has provided a rough sketch of all data elements involved. Each new customer will be printed on a new page.

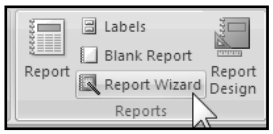


For each customer, the report contains customer name and sales transaction number. A sequence of repeating items purchased on the transaction is next. The transaction purchase is totaled and if the customer has purchased again, the transaction data and purchase data is displayed for a second time. All purchases for the customer are then totaled. The process is repeated for the next customer. The report ends with total sales of purchases by all customers. The report contains a date, title, and page number that are all repeated on *each* page.

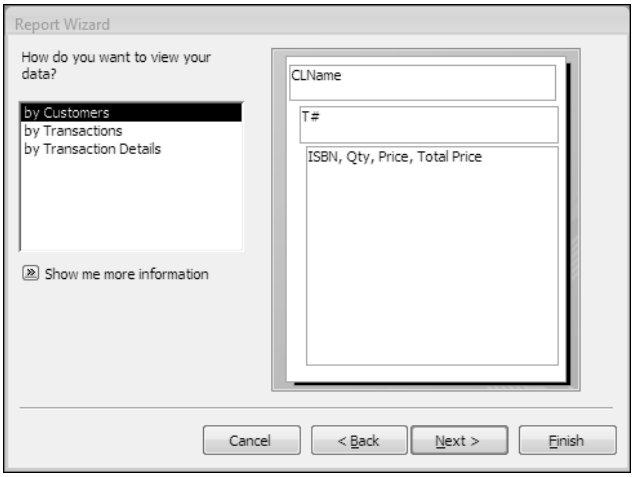
EXERCISE- CREATE A GROUP REPORT (REPORT WIZARD)

After you examine the sketch, determine which table or tables contain the data that you want to display on the report. If all the data is contained in a single table, the report can be based on that table. However, in this example, the data required is contained in three tables; *Customers*, *Transactions*, and *Transaction Details*. In this case, it is better to combine the tables together in a query and then use the query as the record source. We will use the *Qty * Price* query for our record source.

1. Use *Report Wizard* to create the *Customer Sales Report*. On the *Create* tab, in the *Reports* group, click ***Report Wizard***.



2. In the *Report Wizard* dialog box, click the down arrow to the right of the *Tables/Queries* list box and click the *Qty*Price* query to select it.
3. In the report, customer name is displayed before transaction number. We must choose the fields in the order that they will appear on the report. Double-click the *CLName* and then the *T#* fields. Click the *Add all Fields* button to move the rest of the fields in the *Available Fields* list box to the *Selected Fields* list box. Click **Next**.
4. In the next window, Access makes an assumption as to how you wish to view the data based on the data in the query. By clicking a selection on the left a preview is displayed on the right of the window. Click **by Customers**. The preview displays the data closest to the format we are seeking. Click **Next**.



5. We do not want to add any other grouping levels. Click **Next**.
6. We do not need any sort order on the detail information. Click **Next**.

Note: The *Customer*, *Transaction*, and *Total Purchase* totals on the sketch are calculated fields. We will create those directly on the report.

EXERCISE- CREATE A GROUP REPORT (REPORT WIZARD)

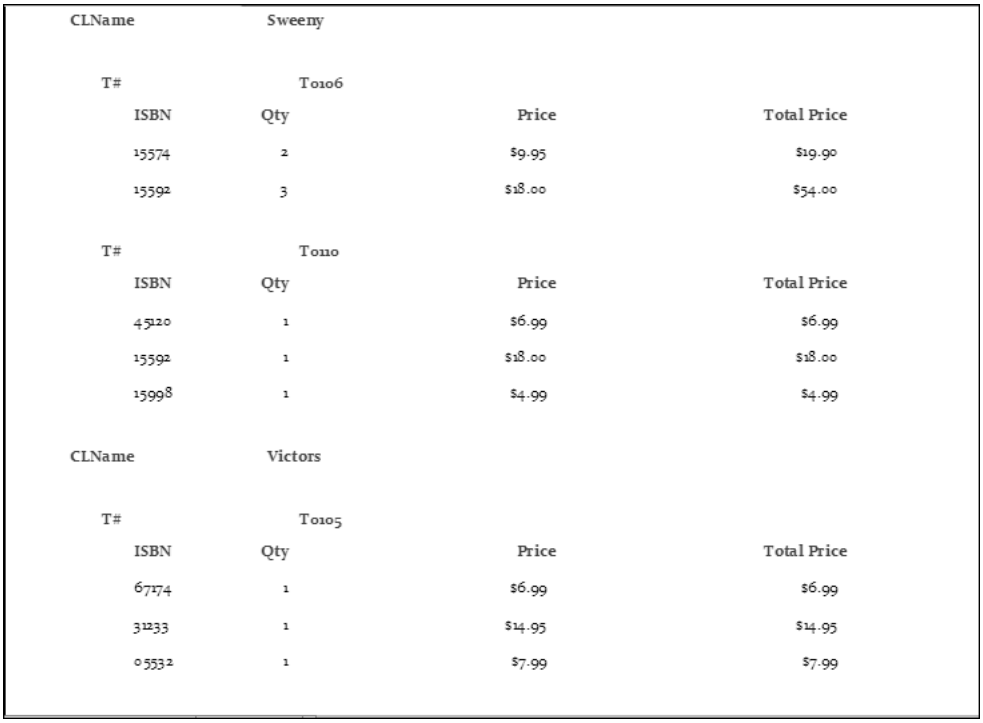
7. Click the *Outline* radio button on the layout choice and choose the *Landscape* page orientation. Click **Next**.

8. Click the Flow style. Click **Next**.

9. In the last window, name the report ***Books4U Customer Sales Report***. Click **Finish**. The report opens in *Print Preview*.

10. Examine the data. Close the *Shutter Bar* on the *Navigation* pane and use the *Zoom* button in the *Zoom* group to reduce the magnification of the report for better viewing. Use the Record Navigator bar to advance to the next page of the report.

    Note: We cannot use an aggregate total in the query to obtain the customer total here. If we did that in the query, we would lose access to the details of each transaction – Access would display a summary total for each customer. For the Customer Sales Report, we need to retain all transaction information.



CLName	Sweeny		
T#	T0106		
ISBN	Qty	Price	Total Price
15574	2	$9.95	$19.90
15592	3	$18.00	$54.00
T#	T0110		
ISBN	Qty	Price	Total Price
45120	1	$6.99	$6.99
15592	1	$18.00	$18.00
15998	1	$4.99	$4.99
CLName	Victors		
T#	T0105		
ISBN	Qty	Price	Total Price
67174	1	$6.99	$6.99
31233	1	$14.95	$14.95
05532	1	$7.99	$7.99

We need to make a number of adjustments to our report to satisfy the requirements given to us by Ana Rivera, the manager. The report requires aggregate totals for each transaction and customer, and a report total. We must add the report title, date, and page number to all new pages. Each customer must go on a new page. Other cosmetic modifications can be done later.

CONTROLS

Enhancing Reports

Controls are objects that display data, perform actions, and let you view and work with information that enhances the user interface, such as labels and images. Controls can be selected, sized, aligned, and moved. We previously visited controls when creating forms.

Three Types of Controls

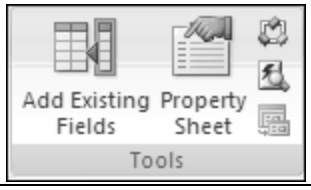
The controls placed on a form or report are classified into three types, depending on the type of data they are associated with. These three types are summarized below.

Control Type	Description
Bound control	The source of data is a field in a table or query. Bound controls are used to display values from the database. The values can be text, dates, numbers, Yes/No values, images, or graphs. A *Text Box* is the most common type of bound control.
Unbound control	A control that doesn't have a source of data. Unbound controls are used to display information, lines, rectangles, and images. The *Label* controls are a type of unbound control.
Calculated control	The source of data is an expression rather than a field. An expression is a combination of operators, control names, field names, functions that return a single value or constant values. An expression can use data from a field in the report's record source or from a control on the report.

When you create a report, it is most efficient to add and arrange all the bound controls first as they are created directly from the reports record source. The unbound and calculated controls can be added to complete the design by using the control tools on the *Design* tab in the *Controls* group.

Control Source

A field can be bound to a control by either typing the field name in the control itself or in the box for the ***ControlSource*** value in the control's *Property Sheet*. The property sheet defines the characteristics of the control, such as name, data source, and format. To display the property sheet in layout or design view, press ***F4***. In design view only, click the *Property Sheet* button in the *Tools* group on the *Design* tab.

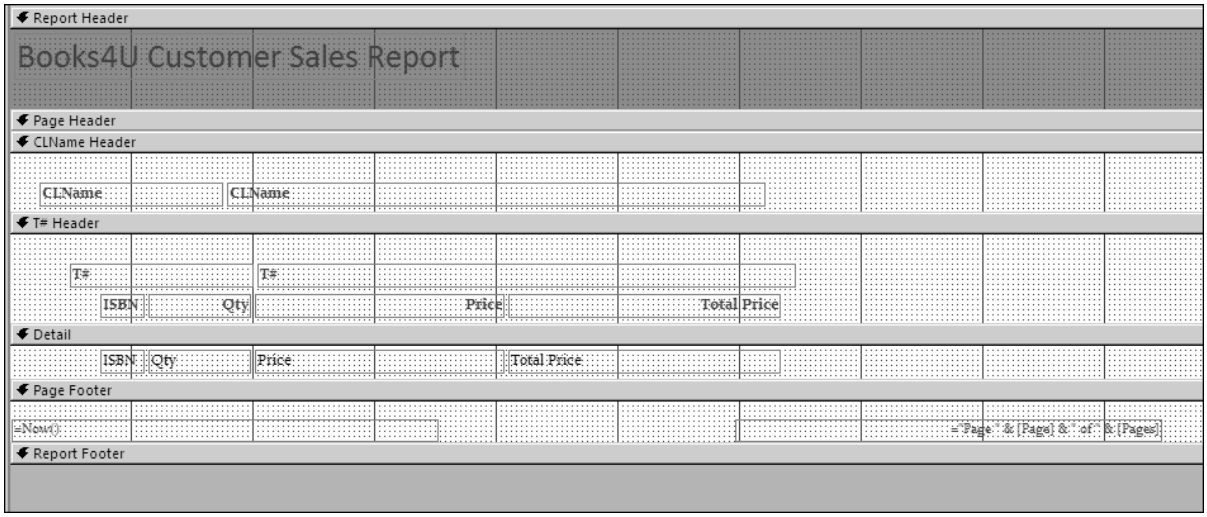


EXERCISE – ENHANCING REPORTS IN DESIGN VIEW

In the ***Books4U Customer Sales Report*** that was created by Access using the *Report Wizard*, some of the control fields are not in the correct place based on our specifications. In this exercise, we will modify the report to match the requirements given to us by the manager, Ana Rivera.

1. The ***Books4U Customer Sales Report*** is currently open in *Print Preview*.

2. Click the *Design View* button on the *Status bar* in the lower right corner of the screen.



3. If needed, close the *Shutter Bar* on the *Navigation* pane for a larger viewing area.

4. Notice that the title, date, and page numbers must be repositioned. Click the **Title** *label control* in the *Report Header* section to select it. Position the mouse pointer inside the orange border of the title control until the pointer changes to a double arrow. Click and drag the mouse pointer until the title is centered above the data on the report. Release the mouse pointer.

5. The ***Date*** control is located in the *Page Footer* section. We need to move it up to the *Report Header* section. Click the date control to select it. Position the mouse pointer inside the orange border of the date control until the pointer changes to a double arrow. Click and drag the mouse pointer through the various report sections until the date is above and to the right of the title in the *Report Header* section of the report. Release the mouse pointer.

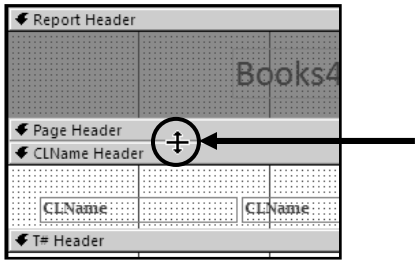
6. The ***Page*** *Number* control must be centered on the page. Click the page control in the *Page Footer* section to select it. Position the mouse pointer inside the orange border of the page control until the pointer changes to a double arrow. Click and drag the mouse pointer until the page number is centered. Release the mouse pointer.

EXERCISE – ENHANCING REPORTS IN DESIGN VIEW

7. Click the *Report View* button on the *Status bar* in the lower right corner of the screen to view the changes. Go back to *Design View* to make any modifications to the controls.

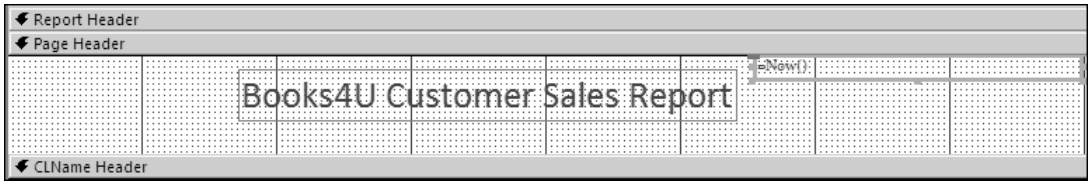
8. *Preview* the report. Click *Print Preview* on the *Quick Access Tool* bar or click the *Office* button roll the mouse over the *print* option and click *print preview.* Advance to the next page using the *Record Navigator* bar. We need to add ***title*** and ***date*** to the top of ***each*** page.

9. Click the *Design View* button on the *Status bar* in the lower right corner of the screen. Expand the *Page Header* section by positioning the mouse pointer between the *Page Header* and *CLName Header* sections until the pointer changes to a double arrow. Click and drag downward to expand the *Page Header* section.



10. Click the *Title* control, hold down the ***Shift*** key, and click the *Date* control. Both controls are selected. Right-click the mouse, select copy. Click in the *Page Header* section. Right-click the mouse and paste. Reposition the *Title* and *Date* controls.

11. As you preview the changes, you will notice that the *Title* and *Date* appears twice on the first page. This is because we left the controls in the *Report Header* section. In *Design View, Report Header Section,* select the *Title* and *Date* controls. Press the *Delete* key. Collapse the *Report Header* section by placing the mouse pointer just above the *Page Header* border until the mouse control turns into a double arrow. Click and drag the *Page Header* border until it touches the *Report Header*.



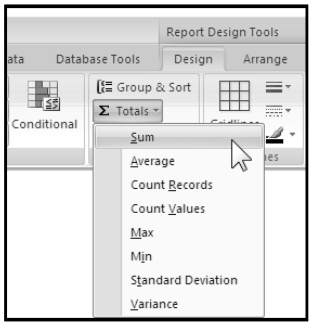
12. Adjust the control boxes to fit the text. The Date control can be shortened by clicking the Date control. Click the bottom and right orange borders and drag to shorten. You can change the font size of the title and fit the control box to accommodate it.

13. **Save** the report.

We will now add the totals to the report.

EXERCISE – ADDING TOTALS TO A REPORT IN DESIGN VIEW

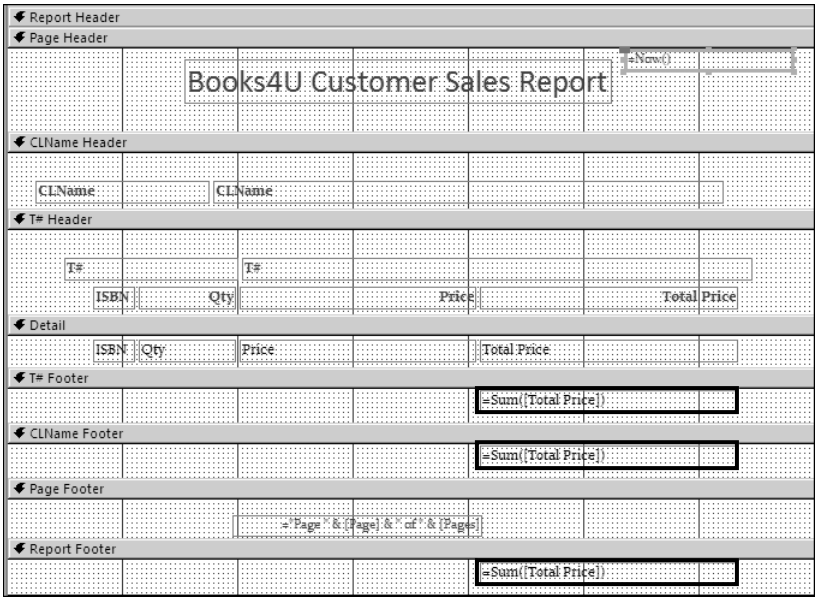
Access 2007 permits the calculation of a sum, average, count, or other aggregates for a field. A grand total is added to the end of the report, and group totals are added to any groups that exist on the report.



1. Click the *Design View* button on the *Status bar* in the lower right corner of the screen.

2. Click the ***Total Price*** *text box* in the ***Detail*** section to select it. On the *Design* tab in the *Grouping & Totals* group, click the *Totals* pull-down menu and select ***Sum***.

3. Access adds a calculated text box control to the Report Footer section, which creates a grand total. Access also adds group footer sections to Transaction and Customer groups and places a total in each footer group.



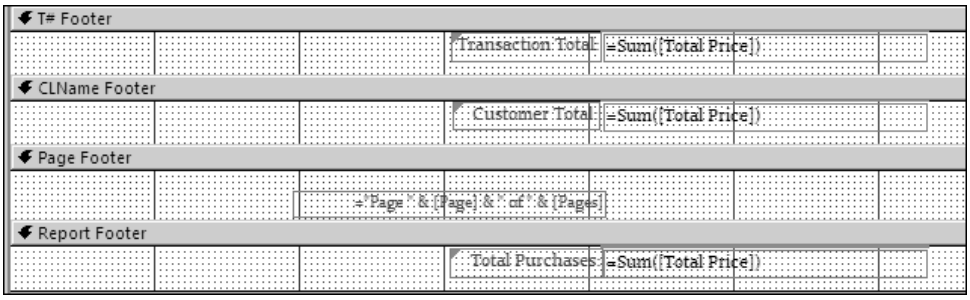
4. Click the *Report View* button on the *Status bar* in the lower right corner of the screen.

5. Examine the data. The report is very similar to the sketch provided. We need to add labels to identify each aggregate total. Click back to *Design View*.

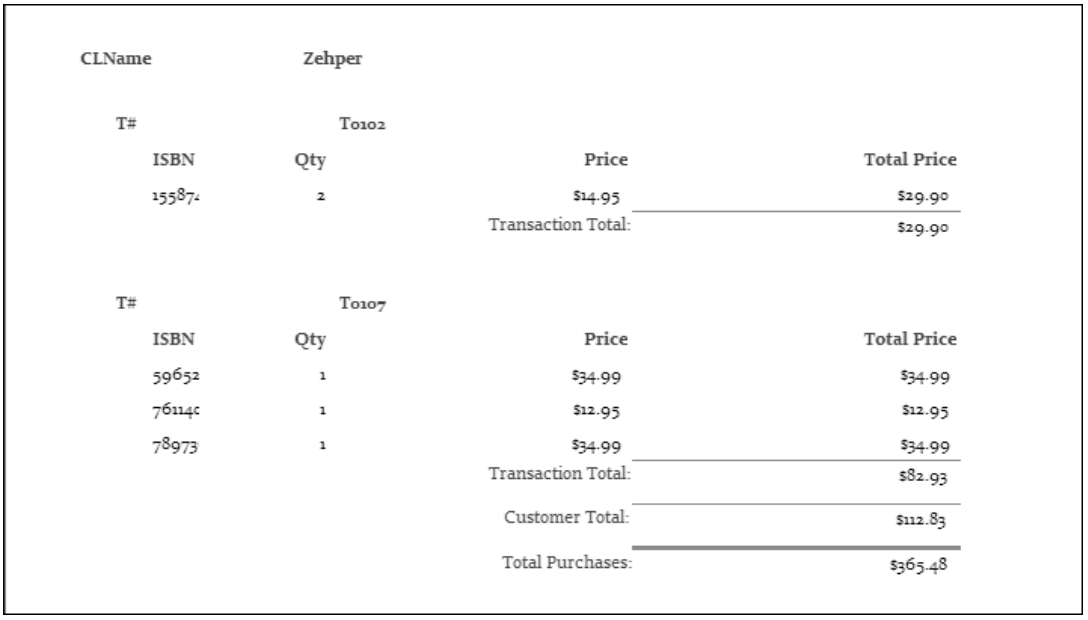
6. Add a *Label* control to the *T# Footer* section. On the *Design* tab, in the *Controls* group, click the *Label* control.

EXERCISE – ADDING TOTALS TO A REPORT IN DESIGN VIEW

7. In the *T# Footer* section, draw a *Label* control box to the left of the *Total Text Box* control. Label the control, ***Transaction Total***. Repeat the process for the *CLName* and *Report Footer* sections, labeling the controls ***Customer Total*** and ***Total Purchases*** respectively.



8. Click the *Report View* button on the *Status bar* in the lower right corner of the screen to view the changes. The report is easier to read with the label controls in place.



CLName Zehper

T# To102

ISBN	Qty	Price	Total Price
15587-	2	$14.95	$29.90
		Transaction Total:	$29.90

T# To107

ISBN	Qty	Price	Total Price
59652	1	$34.99	$34.99
76114C	1	$12.95	$12.95
78973	1	$34.99	$34.99
		Transaction Total:	$82.93
		Customer Total:	$112.83
		Total Purchases:	$365.48

9. **Save** the report.

The next step is to limit one customer per page of the report.

EXERCISE – MODIFYING THE REPORT (PROPERTY SHEET)

Our ***Books4U Customer Sales Report*** is almost finished. Examining the report in either *Layout* or *Report* view, allows us to see the data from the record source and all totals that have been calculated. The title, date, and page numbers have been added to all pages. We now will have the report display one customer per page. This will ensure that customer or transaction information is not split across multiple pages and that the aggregate totals are not separated from detail information.

1. Click the *Print Preview* button on the *Status bar* in the lower right corner of the screen to observe how Access will print the report.

   Notice that in some cases, parts of customer information is split across multiple pages. We want to force Access to display one customer per page.

2. Close the *Print Preview*. Click the *Design View* button on the *Status bar* in the lower right corner of the screen.

3. Customer information first appears in the *CLName Header*. Each time Access detects a customer in the record source that is different from the last, we want this section to print on a new page. Right-click the *CLName Header* and then click *Properties*. The *Property Sheet* opens.

4. Click the *All* tab. Click the pull-down arrow for the *Force New Page* property. We want to force a new page before the customer information is printed. Click *Before Selection*.

5. Close the *Property Sheet*.

6. Click the *Print Preview* button on the *Status bar* in the lower right corner of the screen.

7. Advance to the next page using the *Record Navigator* bar.

8. Customer information is no longer split across multiple pages.

9. **Save** the report.

EXERCISE – ADD A CUSTOM FIELD TO A REPORT

There may be situations where you need to calculate values during report execution and display the calculated values as an additional field in the report. In this exercise, we will add a custom field to a report that will display the result of a calculation. The procedure outlined in this exercise can be used to add any field to a report.

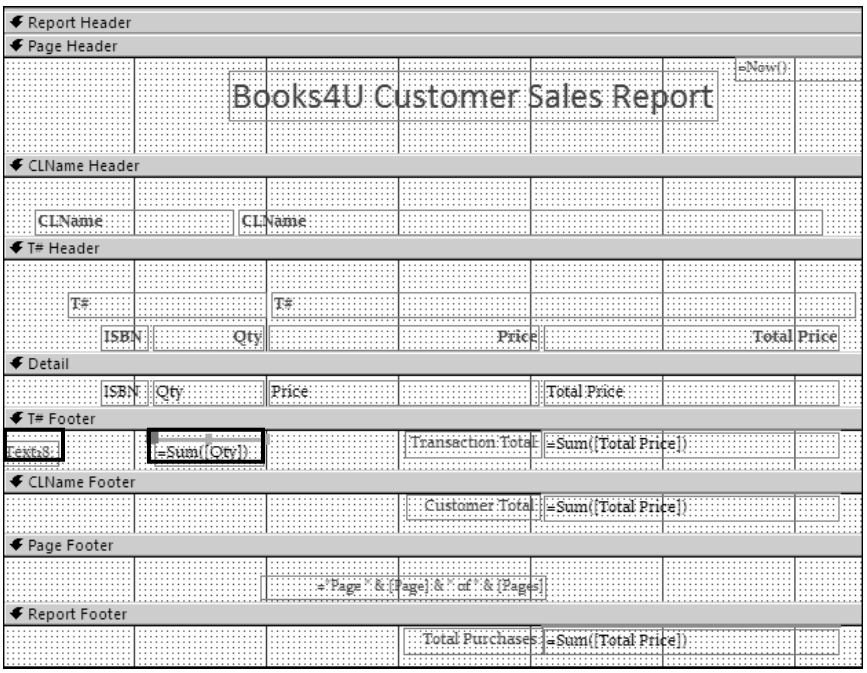
Ana Rivera has decided that she not only wants a dollar total for each transaction, she wants also a total number of books purchased for each transaction.

1. Click the *Design View* button on the *Status bar* in the lower right corner of the screen.
2. The totals for each transaction are displayed in the *T# Footer* section. We will display the total quantity of books there as well. A *Text Box* control is used to display data that is created from the record source. Although our Total Quantity is not stored in the database, quantity (*Qty*) is stored. We will tell Access to sum the *Qty* field, similar to the *Total Price* field earlier.
3. On the *Design* tab, in the *Controls* group, click the *Text Box* control.

4. Position the mouse pointer in the T# Footer section directly underneath the *Qty Text Box* in the *Detail* section. Click and drag to create an object the approximate height and width as the *Qty* control.
5. The *Text Box* control is ***Unbound***; it doesn't have source data. To bind the *Text Box* control to the *Qty* field and sum the value we need an expression. Expressions in Access begin with an equal sign (=). Type **=sum ([Qty])** and then press Enter.

   Qty is in square brackets to signify that the data is found in the database. The sum function (as with all functions) encloses the arguments in parenthesis ( ).

6. Note that when we create a *Text Box* control, Access will also create a *Label* control for us. In this case, we don't need the *Label* control. Click the *Label* control, and then press the Delete key.

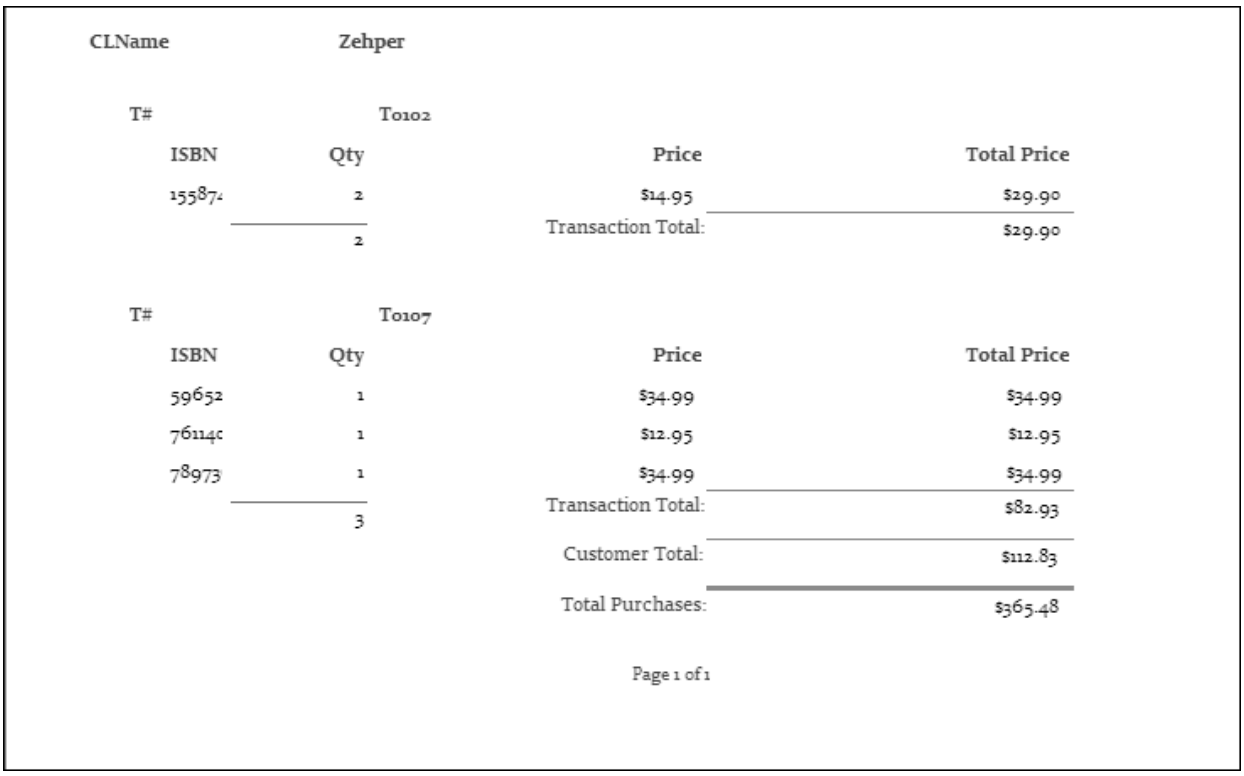


EXERCISE – ADD A CUSTOM FIELD TO A REPORT

7. To make the report readable, draw a dividing line between the detail Qty and the aggregate calculated for Qty. On the *Design* tab, in the *Controls* group, click the *Line* control. Draw a line above the Sum (Qty) text box in the *T# Footer* section.

8. To thicken the line, click the *Line Thickness* control in the *Controls* group. Select the thickness style you want.

9. Click the *Report View* or *Print Preview* button on the *Status bar* in the lower right corner of the screen to examine the report. Go back to *Design View* to make any modifications.



CLName Zehper

T# T0102

ISBN	Qty	Price	Total Price
155874	2	$14.95	$29.90
	2	Transaction Total:	$29.90

T# T0107

ISBN	Qty	Price	Total Price
59652	1	$34.99	$34.99
76114C	1	$12.95	$12.95
78973	1	$34.99	$34.99
	3	Transaction Total:	$82.93
		Customer Total:	$112.83
		Total Purchases:	$365.48

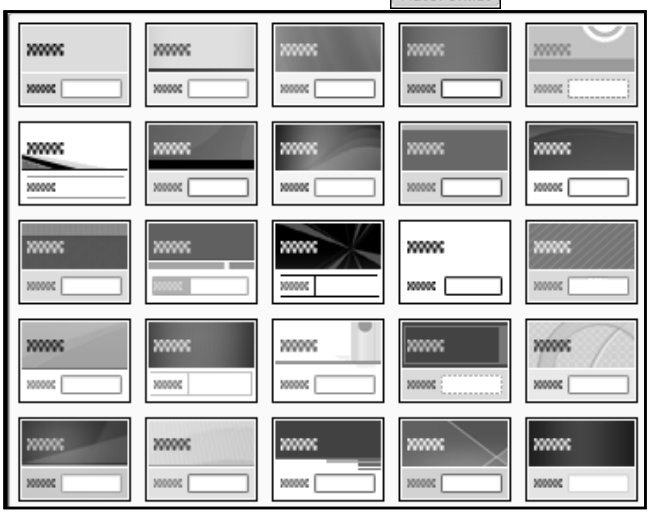
Page 1 of 1

10. **Save** the report.

EXERCISE – APPLY AN AUTOFORMAT TO A REPORT

The AutoFormat feature for reports allows you to apply a predefined design style to an existing report. If you want to change the style for the ***Books4U Customer Sales Report*** use the AutoFormat dialog box in either *Layout* or *Design View*.

1. Click the *Layout View* button on the *Status bar* in the lower right corner of the screen.
2. On the *Format* tab in the *AutoFormat* group, click the pull-down menu. The *AutoFormat* gallery displays.
3. Click the desired style to apply to the report.



4. Check the report formatting. In some cases, the new style will change your original report format. If you find that the new style does not work, click the *Undo* button on the *Quick Access Tool Bar*.
5. To apply an *AutoFormat* style to a report in Design view, click the *Design View* button on the *Status bar* in the lower right corner of the screen.
6. On *the Arrange* tab in the *AutoFormat* group, click the pull-down menu. The *AutoFormat* gallery displays.
7. Click the desired style to apply to the report.
8. Again, check the report formatting. When you find a style that you want to keep, save the report.
9. You can keep the style that you have and add a background fill color to the *Page Header* section,
10. Click the *Page Header* section to select it. On the Design tab in the Font group, click the pull-down on the *Fill/Back* icon.
11. Choose a color. You can click *More Colors* for a wider selection. Click OK.
12. Preview your report. **Save** your report.

NOTES

PRINT A REPORT

Preview Before Printing

Typically, reports are created to be printed. Occasionally, a report contains so much information that the data to be displayed exceeds the size of the print area. If the data overflows the page margins, blank pages may result. You must define the page setup options before printing your report to reduce these problems.

Before printing, it is good practice to preview your report. Reports are displayed in *Print Preview*, so you have previously viewed them in this format. The *Page Setup* tab will be used to define page options before printing.

Page Setup Options

The *Page Setup* tab is automatically enabled in the *Design, Print Preview*, and *Layout* views. Under this tab, in the Page Layout group, is a collection of tools that help you set the paper size, report margins, and choose page orientation style. After you make a change, use the Record Navigation buttons to view several pages to ensure that formatting problems were not created on later pages.

Page Setup Option	Permits You to
Size	Choose the paper size
Portrait	Print the report along the length of the paper
Landscape	Print the report along the width of the paper
Margins	Set the margins. Three options are available; Normal, Wide, and Narrow.
Show Margins	Display the margins in the report window.
Print Data Only	Print the data without the column headers
Columns	Divide the page into two or more columns
Page Setup	Open the Page Setup dialog box; it contains the above options on tabbed pages.

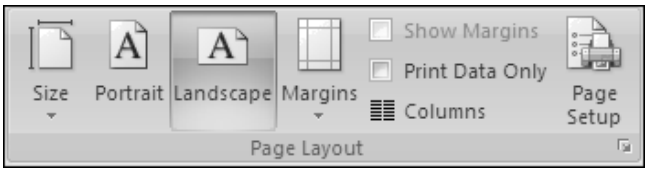
Print the Report

To send the report to the printer, click the *Microsoft Office* button and then click *Print.* When the print dialog box displays, enter your choices for printer options, print range, and number of copies. Click OK.

EXERCISE – PREPARING AND PRINTING A REPORT

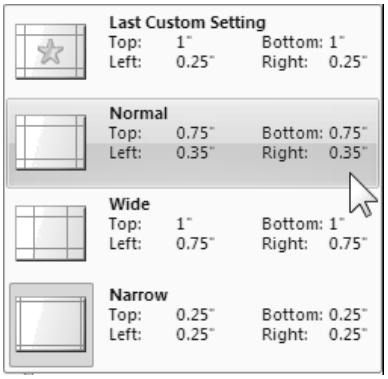
1. Click the *Print Preview View* button on the *Status bar* in the lower right corner of the screen.

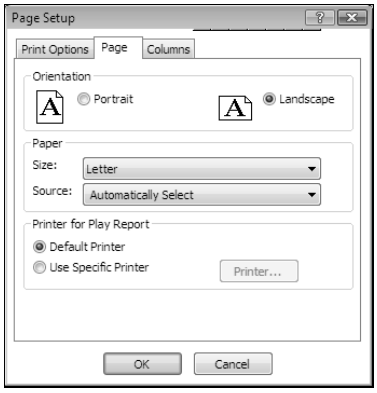
2. The *Page Layout* group displays the *Page Setup* Options.



3. Click the *Landscape* button to change the page orientation.

4. Click the pull-down on the *Margins* buttons to display margin settings. *The Page Setup* button displays the set up options on tabs.



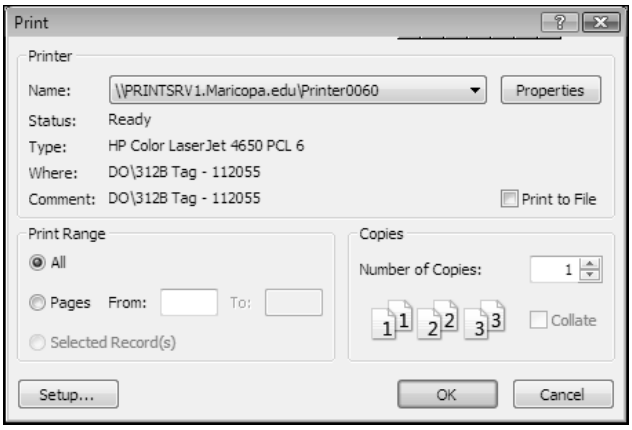


5. When you have made all necessary changes, click *Print* on the *Print Preview* tab.

6. Options for printing are the same as with all Microsoft applications.

7. We will not print this report. Click **Cancel**.

8. Close the report.



USE MSWORD MAIL MERGE WITH ACCESS DATA

Mail Merge Data Source

The Microsoft Word Mail Merge Wizard enables you to link data in an Access table or query to a Microsoft Word document creating letters, e-mail messages, mailing labels, or envelopes. Using the Wizard, you can either link to an existing document or create a new document and then link the data to it.

Mail Merge Wizard

To use the Microsoft Word Mail Merge Wizard in Access, first select the table or query that you want to merge into your letter by clicking it in the *Navigation* pane. Then, from the ribbon, on the *External Data* tab, in *the Export* group, click More and then select *Merge it with Microsoft Office Word.* The Mail Merge Wizard opens and offers you a choice to link to an existing document, or create a new document and then link the data to it. The fields from the selected table or query are available from the Insert Merge Field button on the ribbon when the document opens.

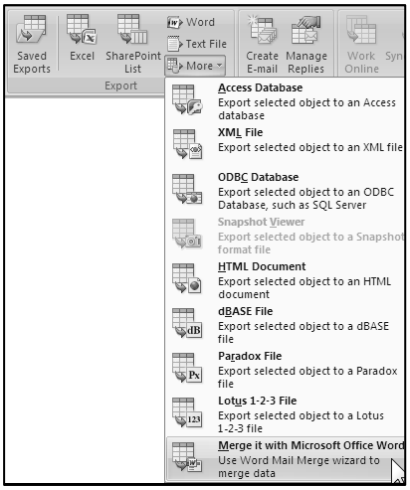
For step-by-step instructions on how to set up a Word mail merge process, see Office Word 2007 Help.

Steps to Using the Mail Merge Wizard

1. Select the table or query to be merged with the form letter.
2. On the *External Data* tab, in *the Export* group, click More and then select *Merge it with Microsoft Office Word.* The Microsoft Word Mail Merge Wizard opens.
3. Choose to create a new document or link to an existing document and click **OK**. The document opens.
4. Follow the steps of the wizard. On the *Mailings* tab in the *Write & Insert Fields* group, click the *Insert Merge Fields* button to insert Access fields into the document.
5. To complete the mail merge, click to step 6 of the process.
6. To personalize your letters, click *Edit individual letters* in the Wizard pane.
7. Save or print the form letters. Click the Microsoft Word Close box.

EXERCISE – ACCESS TABLE AS A DATA SOURCE

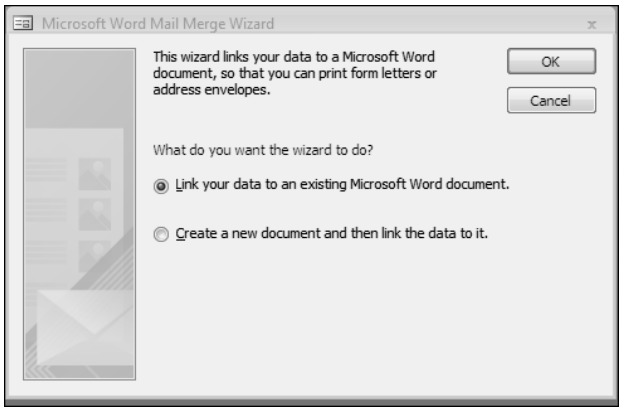
We will start the *Mail Merge Wizard* from Access and create a direct link between a table and an existing MS Word document to generate a sales promotion letter for all ***Books4U*** customers.



1. Click the Customers table in the *Navigation* pane to select it as the source data.

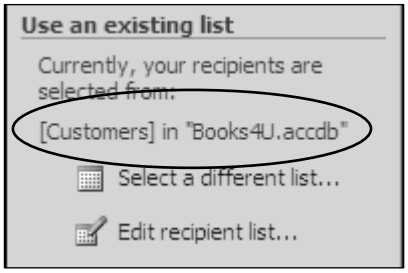
2. On the *External Data* tab, in the *Export* group, click *More* and then select *Merge it with Microsoft Office Word.* The *Microsoft Mail Merge Wizard* opens.

3. Select to create the link to an existing document. Click OK.


Microsoft Word Mail Merge Wizard
This wizard links your data to a Microsoft Word document, so that you can print form letters or address envelopes.
OK
Cancel
What do you want the wizard to do?
Link your data to an existing Microsoft Word document.
Create a new document and then link the data to it.

4. In the Select Microsoft Word Document dialog box, locate and select the ***Sales Promotion Letter*** file from the ***Access 07 Class*** folder. Click **Open**. The document opens in MS Word. The Mail Merge pane is open on Step 3 of 6.

   In step 3, we are creating the link between the data source in Access and the Word document. This link is automatically created because we started the wizard from Access. Under ***Select recipients, Use an existing list*** is selected, and the name of your data source is displayed under ***Use an existing list***.


Use an existing list
Currently, your recipients are selected from:
[Customers] in "Books4U.accdb"
Select a different list...
Edit recipient list...

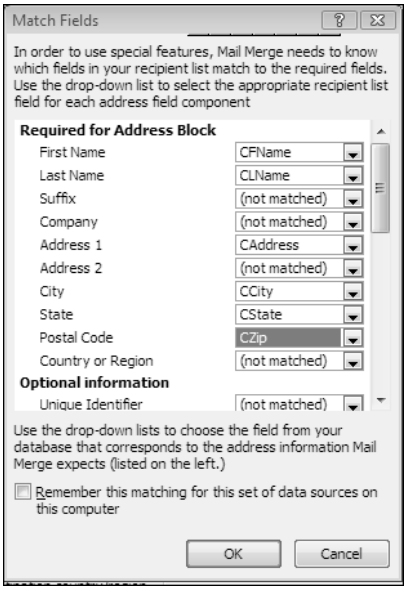
   (Click Edit recipient list if you want to customize the contents of the table or query. You can filter, sort, and validate the data. Click OK to continue.)

5. Click ***Next: Write your letter*** at the bottom of the *Mail Merge* pane to continue.

EXERCISE – ACCESS TABLE AS A DATA SOURCE

6. In step 4 we will create an *Address Block* and a *Greeting Line* for our letter. Position the cursor after the date in the letter and press the ***Enter*** key once to advance the cursor to the next line.

7. We can place the address block in our letter in one of 2 ways; on the *Mailings* tab, in the *Write & Insert Fields* group, click *Address Block*. Clicking the Address block in the *Mail Merge* pane will display the *Insert Address Block* dialog box.


Match Fields
In order to use special features, Mail Merge needs to know which fields in your recipient list match to the required fields. Use the drop-down list to select the appropriate recipient list field for each address field component
Required for Address Block
First Name
CFName
Last Name
CLName
Suffix
(not matched)
Company
(not matched)
Address 1
CAddress
Address 2
(not matched)
City
CCity
State
CState
Postal Code
CZip
Country or Region
(not matched)
Optional information
Unique Identifier
(not matched)
Use the drop-down lists to choose the field from your database that corresponds to the address information Mail Merge expects (listed on the left.)
Remember this matching for this set of data sources on this computer
OK
Cancel

8. Select a format to display the recipient's name. Click the ***Match Fields*** button. The *Match Fields* dialog box opens.

9. On the left side of the *Match Fields* dialog box, the required names of the address block are listed. Use the pull-downs to match those names with the field names in the database table. Click OK. Addresses from the database are displayed in the preview box. Click OK.

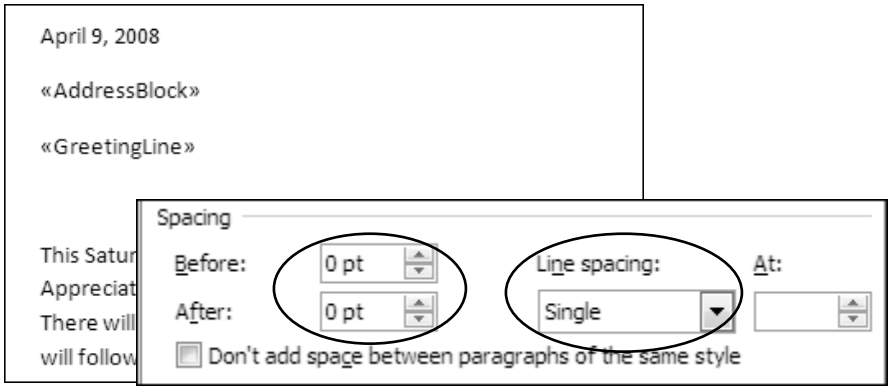
10. Press the ***Enter*** key twice to advance the cursor 2 lines.

11. We can place the greeting line in our letter in one of 2 ways; on the *Mailings* tab, in the *Write & Insert Fields* group, click *Greeting line*. Clicking the Greeting line in the *Mail Merge* pane will display the *Insert Greeting Line* dialog box.

12. Select a format to display the recipient's name. Click the ***Match Fields*** button. The *Match Fields* dialog box opens. Use the pull-downs to resolve any conflicts with the required names for the greeting line and the field names in the database table. Click OK. View the greeting line in the preview box. Click OK.

13. Before moving to the next step, select the Address Block on your letter. Right-click and select Paragraph. The Paragraph dialog box opens.

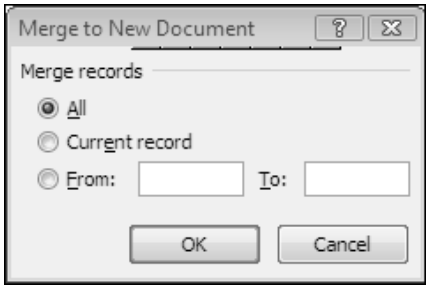
14. Modify the spacing specifications to ensure that the address block prints out in single space. Change the Before/After spacing to zero. Click OK.



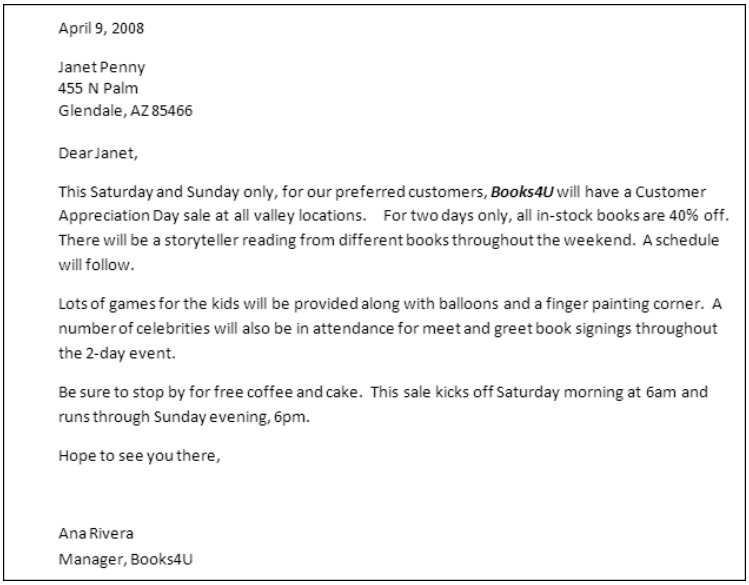
15. The address block and greeting line set-up is now in your sales promotion letter. Click ***Next: Preview your letters*** to continue.

16. Click through the recipients in the Mail Merge pane to view the letter.

17. Click ***Next: Complete the merge***. All letters are created. (*To print all letters, click Print.*) To edit specific letters, Click ***Edit individual letters***. The *Merge to New Document* dialog box opens. Click OK.



18. Using the vertical scroll bar, scroll down to view all letters.



April 9, 2008

Janet Penny
455 N Palm
Glendale, AZ 85466

Dear Janet,

This Saturday and Sunday only, for our preferred customers, ***Books4U*** will have a Customer Appreciation Day sale at all valley locations. For two days only, all in-stock books are 40% off. There will be a storyteller reading from different books throughout the weekend. A schedule will follow.

Lots of games for the kids will be provided along with balloons and a finger painting corner. A number of celebrities will also be in attendance for meet and greet book signings throughout the 2-day event.

Be sure to stop by for free coffee and cake. This sale kicks off Saturday morning at 6am and runs through Sunday evening, 6pm.

Hope to see you there,

Ana Rivera
Manager, Books4U

19. Close the window. Click ***No*** to save the changes. Close MS Word. Click ***No*** to save changes.

20. MS Word closes and you are returned to the Access window.

CREATE MAILING LABELS

Label Reports

Access 2007 gives you several different options for creating labels containing data stored in your Access tables. Labels are created as a report that is formatted to fit the desired label. Mailing labels are the most common use of labels, but any Access data can be printed in a label format for a variety of purposes. With mailing labels, the report retrieves the address data from the table or query containing the addresses. Printing the report gives you a single label of each address from the underlying record source.

Label Wizard

The Label Wizard is the simplest method used for creating labels. The wizard walks you through a series of questions to determine the label format and the fields to display. You can customize the label size, format, font, font size, and font color.

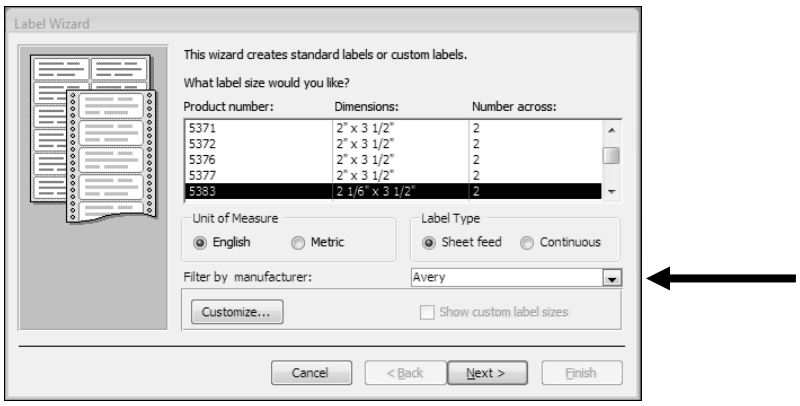
Steps to Create Mailing Labels

1. Click the object in the *Navigation* pane that contains the fields to be printed on the label.
2. On the *Create* tab, in the *Reports* group, click the *Labels* button.
3. The *Label Wizard* is launched.
4. Choose label type, font size and color.
5. Select the fields that will be displayed on the label.
6. Select a field to sort the labels.
7. Name the label report. Click Finish.

EXERCISE – CREATE MAILING LABELS

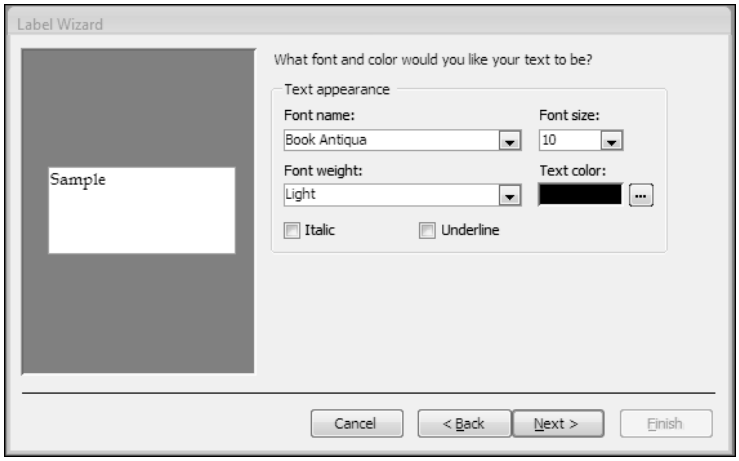
1. Click the *Customers* table object in the *Navigation* pane.

2. On the *Create* tab, in the *Reports* group, click the *Labels* button. Access launches the *Label Wizard*.



3. Choose label size, ***5383***. In the Filter by manufacturer text box, use the pull-down to select *Avery*.

4. Select English in the Unit of Measure field, and Sheet feed in the Label Type field. Click **Next**.



5. At the Font name text box, use the pull-down and select *Book Antigua*. Change font size to *10*. Click Next.

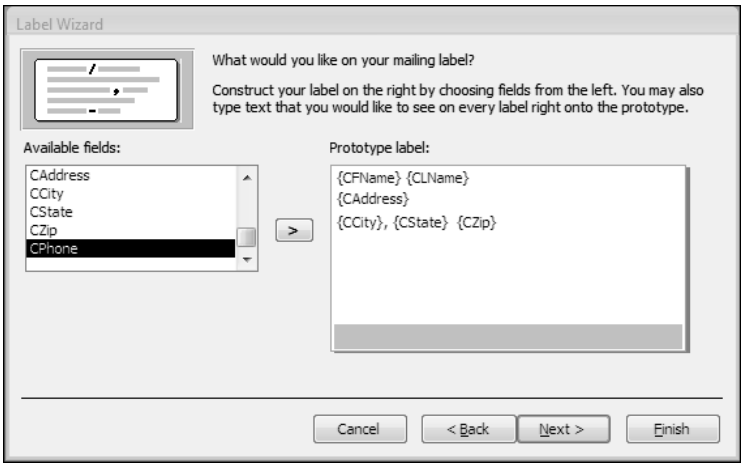
Choose the fields you want on your labels from the *Available Fields* list, and double-click them to add to the *Prototype* label box. Create your address label as you would a regular address, with spaces and commas.

6. From the *Available fields* list, double-click *CFName*. In the *Prototype* label window, press the space bar one time. Double-click *CLname*. Press the **Enter** key.

7. Double-click *CAddress*. Press the **Enter** key.

8. Double-click *Ccity*, type a comma (,) and press the space bar one time. Double-click CS*tate*. Press the space bar twice. Double-click *CZip.*

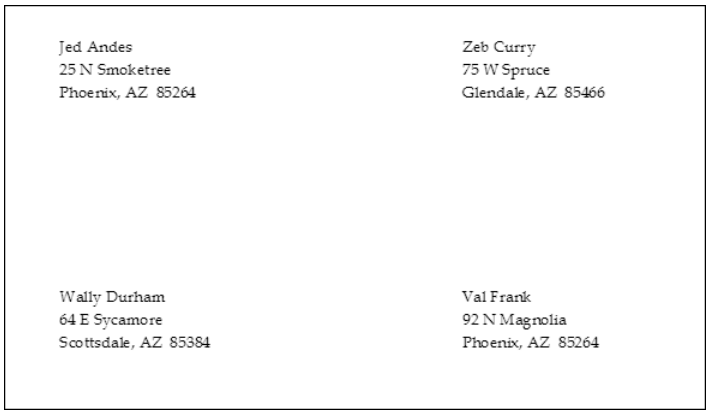
9. Click **Next**.



10. Sort the labels by double-clicking the *CLName* field. Click **Next**.

11. In the last wizard window, name the report *Customer Labels*. Click **Finish**.

12. The report opens in *Print Preview* layout.



13. Save the report. Close the report.

NOTES

INTEGRATE PROGRAMS – EXPORTING DATA

Sharing with Excel or Word

An advantage of a suite program like Microsoft Office is the ability to exchange data from one program to another. Access offers a feature to export data to different file formats such as Excel or Word. A copy of the data is created in an external source file, and the original data is retained in the database.

Using the *Export* group on the *External Data* tab allows you to export either a table, query, or form to Excel. If a table contains subdatasheets or a form contains subforms, you must export each subdatasheet or subform to view them in Excel.

Access allows you to export a table, query, form, or report to MS Word. When you export a report, the wizard exports the report data and layout. It tries to make the Word document resemble the report a closely as possible.

Macros and Modules cannot be exported.

Steps to Exporting Data

1. Click the desired object for export in the Navigation pane.
2. On the *External Data* tab, in *the Export* group, click the *Excel* or *Word* button.
3. The Excel Spreadsheet dialog box or the RTF File dialog box opens.
4. Click the Browse button.
5. At the File Save dialog box, navigate to desired folder, then click Save.
6. Click the desired options.
7. Click OK.

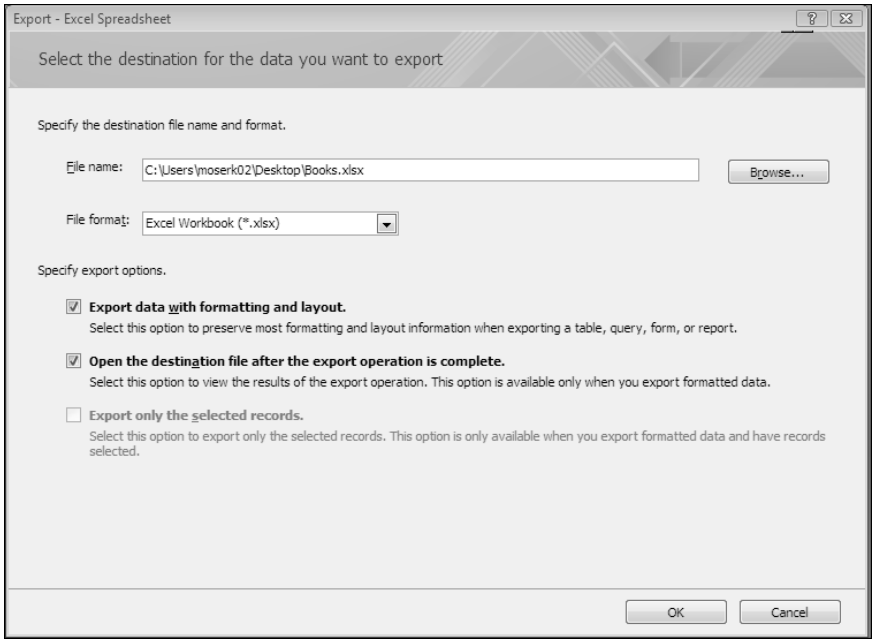
EXERCISE – EXPORT A TABLE TO EXCEL

Ana Rivera, manager of ***Books4U***, wants to look at the book information over the weekend, but she does not have Access installed on her laptop. She wants to export the book information to Excel.

1. In the *Navigation pane*, click on the ***Books*** table to select it.
2. On the *External Data* tab, in the *Export* group, click *Excel*. The *Excel Spreadsheet* dialog box opens.
3. Click the *Browse* button.
4. At the File Save dialog box, navigate to the ***Access 07 Class*** folder on the desktop and click Save.

   The export wizard automatically inserts the name of the table in the File name text box.
5. At the Excel Spreadsheet dialog box, click the *Export data with formatting and layout* check box.
6. Click the *Open the destination file after the export operation is complete* check box. Click OK.

   Excel opens with the book data in the worksheet.


Export - Excel Spreadsheet
Select the destination for the data you want to export
Specify the destination file name and format.
File name:
C:\Users\moserk02\Desktop\Books.xlsx
Browse...
File format:
Excel Workbook (*.xlsx)
Specify export options.
Export data with formatting and layout.
Select this option to preserve most formatting and layout information when exporting a table, query, form, or report.
Open the destination file after the export operation is complete.
Select this option to view the results of the export operation. This option is available only when you export formatted data.
Export only the selected records.
Select this option to export only the selected records. This option is only available when you export formatted data and have records selected.
OK
Cancel

7. *Save* the Excel file. *Close* the file. Do not save the export steps. Click **Close**.

EXERCISE – EXPORT A REPORT TO MS WORD

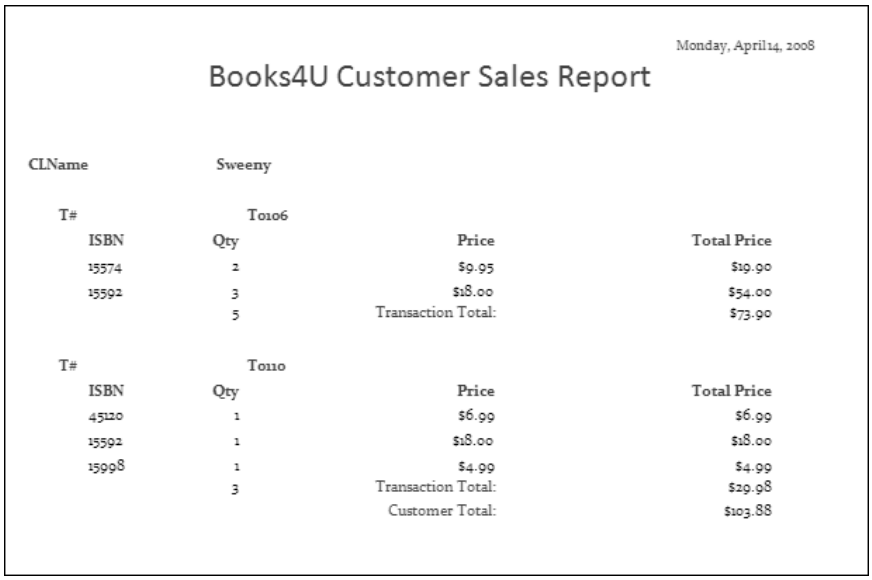
Lori Jones, ***Books4U*** *bookkeeper*, needs the Sales Report in MS Word format.

1. In the *Navigation pane*, click on the ***Books4U Customer Sales Report*** to select it.
2. On the *External Data* tab, in the *Export* group, click *Word*. The *Report RTF File* dialog box opens.
3. Click the *Browse* button.
4. At the File Save dialog box, navigate to the ***Access 07 Class*** folder on the desktop and click Save.

   The export wizard automatically inserts the name of the report in the File name text box.

5. At the *Report RTF File* dialog box, click the *Open the destination file after the export operation is complete* check box. Click OK.

   MS Word opens and the Sales report is displayed in a Word document.



Monday, April 14, 2008

Books4U Customer Sales Report

CLName Sweeny

T# T0106

ISBN	Qty	Price	Total Price
15574	2	$9.95	$19.90
15592	3	$18.00	$54.00
	5	Transaction Total:	$73.90

T# T0110

ISBN	Qty	Price	Total Price
45120	1	$6.99	$6.99
15592	1	$18.00	$18.00
15998	1	$4.99	$4.99
	3	Transaction Total:	$29.98
		Customer Total:	$103.88

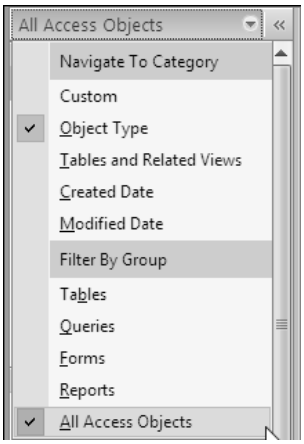
   The file extension – .rtf – signifies that the file is saved in rich-text format, which preserves formatting such as fonts and styles.

6. Save the Word document. Close the file.
7. Click the close button on the Export – RTF dialog box.

EXERCISE – EXPORT 2007 DATABASE TO ACCESS 2003

Ana Rivera, manager, wants Lori Jones, bookkeeper, to have a look at the database this weekend and report any errors in recording information. However, Lori uses Access 2003 at home and the software will not open the Access 2007 ***Books4U*** database. Ana needs to convert the database so that Lori can use it at home.

1. Close all database objects.
2. Click the *Office* Button. On the menu for Save As under *Save the database in another format*, click ***Access 2002-2003 Database***.
3. At the Save As dialog box, navigate to the *Access 07 Class* folder. Modify the name if necessary. Note the file type.
4. Click Save.
5. The database in the alternate format opens.
6. Click the *Options* button on the *Message bar* and *Enable* the content.
7. In the Navigation pane, use the pull-down to click *Object Types* and *All Access Objects* displaying all objects in the database.



8. Examine the list to be sure that all objects were transferred.
9. Close the database.

EXERCISE – CLONE THE DATABASE

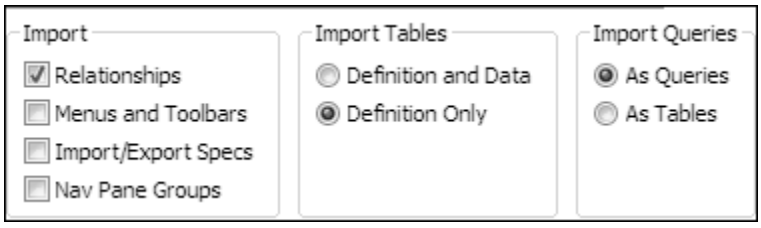
The ***Books4U*** database did an excellent job of tracking annual data. Ana Rivera wishes to start the New Year with new data, and would like to archive data from the existing year. However, she does not want to recreate the database structure.

Cloning the database will allow us to import the database structure without the data. It will keep the original database in tact.

1. Open the Books4U database. Click the *Options* button on the *Message bar* and *Enable* the content.
2. Click the *Office Button* and then click New.
3. At the *Getting Started with Microsoft Office Access* welcome screen, click the Blank Database icon in the middle pane.
4. In the right pane, click the browse icon. Navigate to the *Access 07 Class* folder. Name the file ***Books4U New***. Click OK.
5. Click Create. A new blank database is opened.

   We have a new blank database. We will import just the database structure from our original database.

6. On the *External Data* tab in the *Import* group, click *Access*. On the *Get External Data* dialog box, click the browse button. Navigate to the *Access 07 Class* folder. Double-click ***Books4U***.
7. Click the Import radio button. Click OK.
8. The *Import Objects* dialog box opens. Click the ***Tables*** tab. Click ***Select All***. Repeat for the ***Queries***, ***Forms***, and ***Reports*** tabs.
9. Click the *Options* button.
10. Check to import relationships. We do not want to import the data so click the *Definition Only* radio button. We also want to import all queries as queries. Click OK.



EXERCISE – CLONE THE DATABASE

11. Close the *Get External Data* window.

12. Close Table1.

13. In the Navigation pane, use the pull-down to click *Object Types* and *All Access Objects* displaying all objects in the database.

14. Open the *Books* table in *Design* view. The structures have been transferred. However, the Datasheet view displays no records. Your tables are now ready to insert the new data.

15. Examine the Forms and Reports. Modify the relationship diagram.

16. Close the ***Books4U New*** database.

NOTES

Appendices

Additional Features in Access 2007

APPENDIX A - ON-LINE HELP

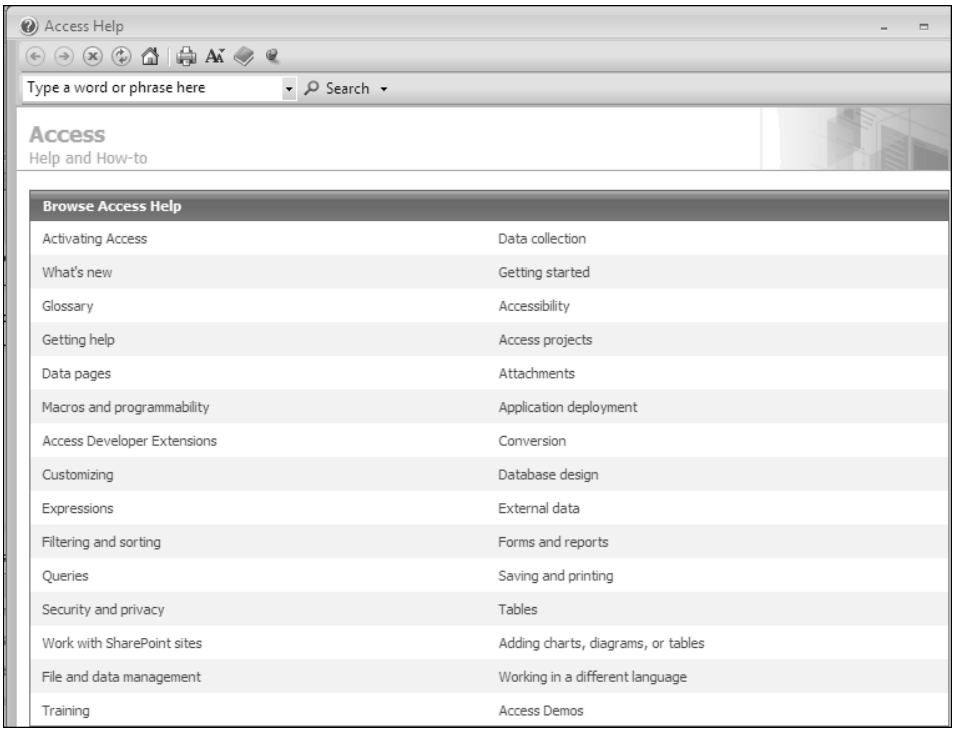
Accessing Help

As you work with Access 2007 and find that you want to develop more complex designs using tools and options that are unfamiliar, you might need some assistance in discovering what they can do for you. The *Access 2007 Help* feature is a complete user manual with both offline and online links to direct you.

An extensive online (default) Help resource contains information on all Access features and commands. To open the Access Help window, click the Help button located in the upper right corner of the screen just below the Title bar.

Online Help

The main Access Help window contains links to categories of help topics. Either click a category link, or type a search word or phrase in the textbox and click ***Search***.



Offline Help

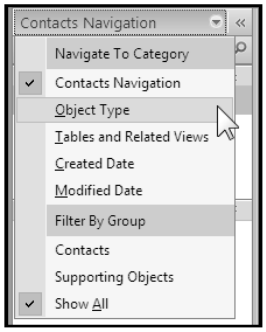
Help information is available without internet access, although fewer resources display help topics when using offline help.

APPENDIX B - DATABASE TEMPLATES

Access provides database templates that can be used to create new database files. The templates are complete applications that contain predefined tables, queries, forms, reports, and relationships. They are designed so that you can create a new database quickly, however, you can make modifications to suit your personal needs.

The *Getting Started with Microsoft Office Access* welcome screen features a number of online templates.

1. Double-click *Contacts* in the *Featured Online Templates* section in the center pane.
2. Click the browse button next to the file name text box in the right pane.
3. At the *File New Database* dialog box, navigate to the *Access 07 Class* folder, add your initials to the file name and click OK.
4. Click the Download button. Access downloads the database template from Microsoft Office Online and displays the Contact List form along with the Access Help window.
5. Close the Help window and click the shutter bar to open the Navigation pane.
6. Click the pull-down arrow to the right of Contacts Navigation and then click Object Type at the drop-down list to display all database objects.
7. You can now open any object in *Design* view or *Layout* view to make changes as appropriate for your application.



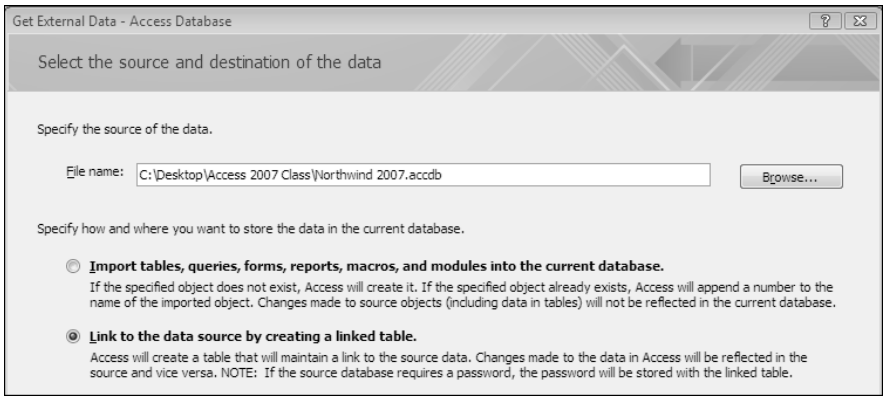
APPENDIX C - LINK TO AN EXTERNAL TABLE

Linking allows you to connect to a table in another database without importing it. Importing the table makes a copy that becomes part of your database. Any changes to the original table are not reflected in your copy. Linking allows you to modify and view the latest data in both the source and destination databases without creating and maintaining two copies of the same data.

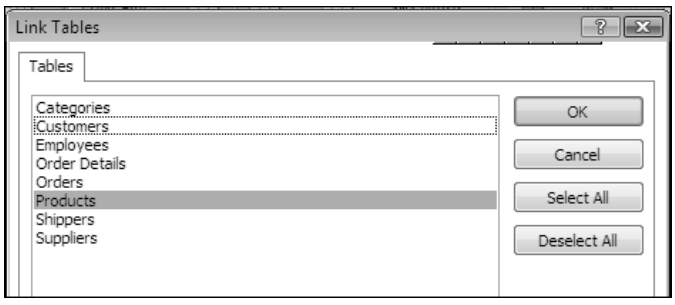
Although you can edit and update data in linked tables, you are prevented from making changes to the structure of the tables in the destination database. You cannot add, delete, or modify the data type of a source field. You cannot link to queries, forms, reports, macros, or modules.

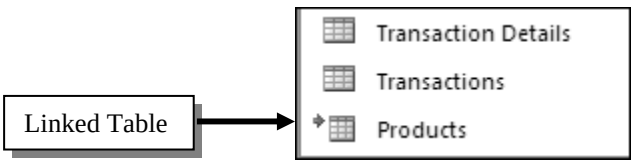
We will link to the *Products* table in the *Northwind* database.

1. On the *External Data* tab, in the *Import* group, click *Access*.
2. In the File name text box, type the name of the source database, or click Browse to display the *File Open* dialog box. Navigate to the *Northwind* database in the ***Access 07 Class*** folder. Click Open.
3. Click *Link to the data source by creating a linked table*, and then click OK.


Get External Data - Access Database
Select the source and destination of the data
Specify the source of the data.
File name:
C:\Desktop\Access 2007 Class\Northwind 2007.accdb
Browse...
Specify how and where you want to store the data in the current database.
Import tables, queries, forms, reports, macros, and modules into the current database.
If the specified object does not exist, Access will create it. If the specified object already exists, Access will append a number to the name of the imported object. Changes made to source objects (including data in tables) will not be reflected in the current database.
Link to the data source by creating a linked table.
Access will create a table that will maintain a link to the source data. Changes made to the data in Access will be reflected in the source and vice versa. NOTE: If the source database requires a password, the password will be stored with the linked table.

4. In the *Link Tables* dialog box, select the *Products* table. Click OK to finish.
5. Access creates the linked tables. Open the table in datasheet view.





APPENDIX D - COMPACT AND REPAIR

Database files grow quickly as you work with them and can sometimes become fragmented because records and objects have been deleted or damaged. This in turn can impede performance as the disk space grows larger than necessary.

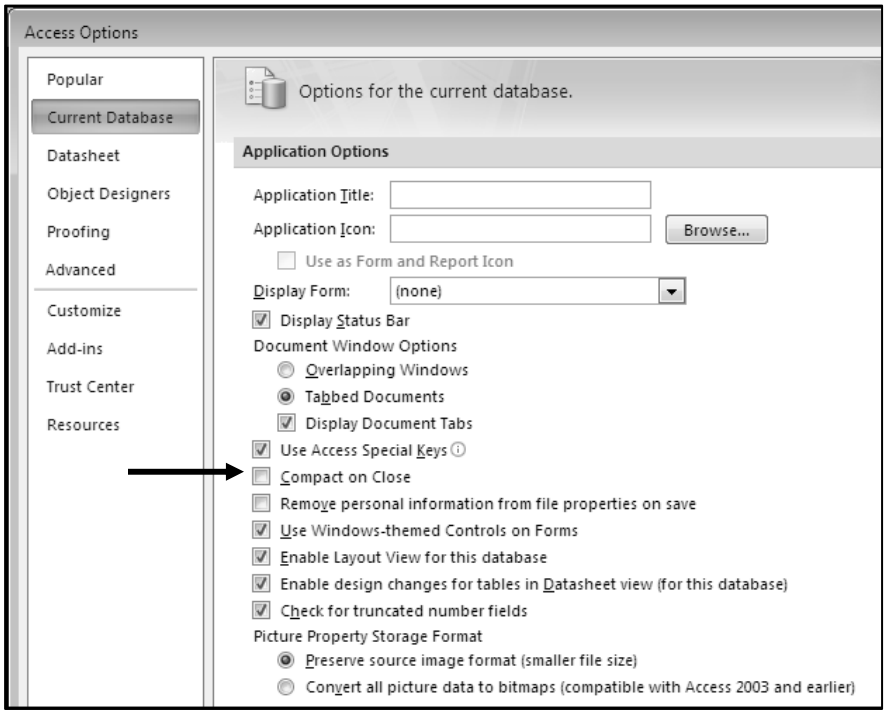
Compacting the database defragments the file and reduces the required disk space. Compacting and repairing a database also ensures optimal performance while using the files. You can set a database option that causes the Compact and Repair feature to run automatically each time you close the database if you are a single user of the database.

Before you begin, always make a backup. Access includes a backup utility to facilitate this process.

1. Make a backup. Click the *Microsoft Office Button*, point to *Manage*, and then click *Back Up Database*.
2. In the *Save As* dialog box that opens, notice the file name that Access supplies; the original name of the file and the date of the backup. Click Save.
3. With the database open, click the *Microsoft Office Button*, point to *Manage*, and then click *Compact and Repair Database*.

   You can select the Compact on Close database option if you want to automatically compact and repair a database when it closes.

4. Click the *Microsoft Office Button* and then click *Access Options* at the bottom of the window.
5. In the Access Options dialog box, click *Current Database*.
6. Under *Application Options*, select the *Compact on Close* check box.
7. You can check the file size before and after the Compact and Repair option to see that the amount of disk space is much smaller.



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